

A1H
AR2
3.2
HYESD
12.6

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10

IN THE MATTER OF:

HYLEBOS WATERWAY OF THE COMMENCEMENT
BAY NEARSHORE/TIDEFLATS SUPERFUND SITE

ASARCO INC., ELF ATOCHEM NORTH AMERICA
INC., GENERAL METALS OF TACOMA, INC.,
KAISER ALUMINUM & CHEMICAL
CORPORATION, OCCIDENTAL CHEMICAL
CORPORATION, AND THE PORT OF TACOMA

RESPONDENTS.

Proceeding Under Sections 104, 122(a),
and 122(d)(3) of the Comprehensive
Environmental Response, Compensation,
and Liability Act as amended,
42 U.S.C §§ 9604, 9622(a),
9622(d)(3)).

U.S. EPA Docket No.
1093-07-03-104/122

ADMINISTRATIVE ORDER
ON CONSENT FOR
PRE-REMEDIAL DESIGN STUDY

683056

AR 3.2

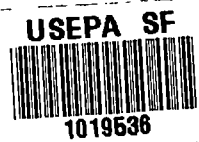


TABLE OF CONTENTS

I.	INTRODUCTION	3
II.	JURISDICTION	3
III.	PARTIES BOUND	4
IV.	STATEMENT OF PURPOSE	5
V.	FINDINGS OF FACT	6
VI.	CONCLUSIONS OF LAW AND DETERMINATIONS	15
VII.	NOTICE TO STATE	16
VIII.	WORK TO BE PERFORMED	17
IX.	MODIFICATION OF WORK PLAN	25
X.	QUALITY ASSURANCE	28
XI.	PROPOSED REMEDIATION PLAN, PUBLIC COMMENT, ADMINISTRATIVE RECORD	28
XII.	PROGRESS REPORTS AND MEETINGS	29
XIII.	SAMPLING ACCESS, AND DATA AVAILABILITY/ADMISSIBILITY	30
XIV.	DESIGNATED PROJECT COORDINATORS, NOTICES AND SUBMISSIONS	34
XV.	OTHER APPLICABLE LAWS	37
XVI.	RECORD PRESERVATION	37
XVII.	DISPUTE RESOLUTION	37
XVIII.	STIPULATED PENALTIES	40
XIX.	FORCE MAJEURE	43
XX.	REIMBURSEMENT OF RESPONSE AND OVERSIGHT COSTS	45
XXI.	RESERVATION OF RIGHTS AND REIMBURSEMENT OF OTHER COSTS	47
XXII.	DISCLAIMER	48
XXIII.	OTHER CLAIMS	48
XXIV.	FINANCIAL ASSURANCE, INSURANCE, AND INDEMNIFICATION	49
XXV.	EFFECTIVE DATE AND SUBSEQUENT AMENDMENT	52
XXVI.	TERMINATION AND SATISFACTION	52

I. INTRODUCTION

1. This Administrative Order on Consent (Order) is entered into by the United States Environmental Protection Agency (EPA) and ASARCO Inc., Elf Atochem North America, Inc., General Metals of Tacoma, Inc., Kaiser Aluminum & Chemical Corporation, Occidental Chemical Corporation, and the Port of Tacoma (Respondents). The Order concerns the preparation and performance of Pre-Remedial Design work (PRD), and reimbursement of oversight costs. The PRD is to be performed for the Remedial Design (RD) and Remedial Action (RA) of a portion of the Sediments Operable Unit (OU1) of the Commencement Bay/Nearshore Tidelands (CB/NT) Superfund Site, consisting of the Head of the Hylebos Waterway problem area and the Mouth of the Hylebos Waterway problem area. This Order addresses the entire Hylebos Waterway, including the Mouth of the Hylebos Waterway problem area and the Head of the Hylebos Waterway problem area. Hereinafter when not specifically discussed separately, the Head and Mouth of the Hylebos Waterway problem areas will be referred to as the Hylebos Waterway or the Site.

II. JURISDICTION

2. This Order is issued under the authority vested in the President of the United States by Sections 104, 122(a) and 122(d)(3) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, 42 U.S.C. §§ 9604, 9622(a), 9622(d)(3), which authorizes the President to issue an order setting forth the obligations of the Respondents with respect to a settlement agreement for action under Section 104(b) of CERCLA. This authority was delegated to the

HYLEBOS ADMINISTRATIVE ORDER ON CONSENT - Page 3

1 Administrator of EPA on January 23, 1987, by Executive Order 12580,
2 52 Fed. Reg. 2926 (1987); further delegated to the EPA Regional
3 Administrators on September 13, 1987, by EPA Delegation No.
4 14-14-C; and redelegated by the Regional Administrator to EPA
5 Region 10 Superfund Branch Chief on September 27, 1990.

6 3. Respondents agree to undertake all activities required by
7 the terms and conditions of this Order. In any action by EPA or
8 the United States to enforce the terms of this Order, Respondents
9 consent to, and agree not to contest, the authority or jurisdiction
10 of EPA to issue or enforce this Order, and agree not to contest the
11 validity of this Order or its terms.

12 III. PARTIES BOUND

13 4. This Order shall apply to and be binding upon EPA and
14 Respondents, their successors and assigns. Respondents are jointly
15 and severally responsible for carrying out all actions required of
16 them by this Order. The signatories to this Order certify that
17 they are authorized to execute and legally bind the parties they
18 represent to this Order. Changes in ownership or in corporate or
19 other legal status, including, but not limited to, any transfer of
20 assets or real or personal property or business organization, shall
21 in no way alter Respondents' duties under this Order.

22 5. Respondents shall provide a copy of this Order to any
23 subsequent owners or successors in interest before any controlling
24 ownership rights, stock or assets in a corporate acquisition are
25 transferred. Respondents shall notify EPA at least thirty (30)
26 days prior to any such transfer. Respondents shall provide a copy
27 of this Order to all contractors, subcontractors, laboratories, and

1 consultants retained to perform any work under this Order, within
2 fourteen (14) days after the effective date of this Order, or the
3 date such services are retained, whichever is later, and shall
4 condition all contracts entered into hereunder to performance of
5 the work in conformity with the terms of this Order. Any reference
6 herein to the Order shall mean the Order, any Appendix thereto, any
7 future modifications as provided by the terms of the Order as may
8 be added hereafter, and any work plans, reports, plans,
9 specifications, schedules, and appendices required by this Order
10 which, upon approval of EPA, shall be incorporated into and
11 enforceable under the Order. Notwithstanding the terms of any
12 contract, Respondents are responsible for compliance with this
13 Order and for ensuring that their subsidiaries, employees,
14 contractors, consultants, subcontractors, agents, and attorneys
15 comply with this Order.

16 IV. STATEMENT OF PURPOSE

17 6. In entering into this Order, the objectives of EPA and
18 Respondents are: (a) to perform pre-remedial design work for the
19 Hylebos Waterway consistent with the Record of Decision of the
20 Commencement Bay Nearshore/Tideflats (CB/NT) Sediments Operable
21 Unit (OU 01) of the CB/NT Superfund Site that was issued by EPA on
22 September 29, 1989 (the ROD), and as may be amended or modified by
23 EPA, and to perform analyses and studies needed by EPA to select
24 a Remediation Plan, including an acceptable confined disposal site
25 and any necessary mitigation which attains Sediment Cleanup
26 Objectives identified in the ROD, as amended or modified by EPA,
27 and all applicable or relevant and appropriate requirements, as
28 HYLEBOS ADMINISTRATIVE ORDER ON CONSENT - Page 5

1 defined in the National Oil and Hazardous Substances Pollution
2 Contingency Plan, 40 C.F.R. Part 300, as amended (the NCP); and
3 (b) provide for recovery by EPA of its response and oversight costs
4 incurred with respect to the implementation of this Order. EPA is
5 agreeing to divide the remedial design into a pre-remedial design
6 phase and remedial design phase because Respondents intend,
7 following submittal of the Pre-Design Evaluation Report, to
8 participate in negotiations of a consent decree for payment of
9 EPA's past and future response costs and for performance of
10 remedial design and remedial action (RD/RA) of the Remediation Plan
11 approved by EPA under this Order.

12 7. The activities required by this Order are subject to
13 approval by EPA and shall provide all necessary and appropriate
14 information for the PRD, consistent with the ROD, and in accordance
15 with the requirements of CERCLA, as amended, and the NCP. The
16 activities conducted pursuant to this Order shall be conducted in
17 compliance with all applicable EPA guidances, policies, and
18 procedures.

19 8. By entering into this Consent Order, Respondents make no
20 admission of liability nor do they waive any right, claim, remedy,
21 appeal, cause of action, or defense, except as specifically
22 described herein.

23 V. FINDINGS OF FACT

24 The following paragraphs summarize the factual findings made
25 by EPA in support of the Conclusions of Law and Determinations in
26 this Consent Order. Respondents neither admit nor deny them, and
27 reserve their rights to contest them, except in proceedings under
28 HYLEBOS ADMINISTRATIVE ORDER ON CONSENT - Page 6

1 this Consent Order and as provided in Paragraphs 3 and 88.

2 9. The Hylebos Waterway is within the boundaries of the
3 CB/NT Superfund Site. The CB/NT Superfund Site is located in
4 Tacoma, Washington, at the southern end of the main basin of Puget
5 Sound. The Mouth of the Hylebos Waterway and Head of the Hylebos
6 Waterway are two of eight problem areas that have been designated
7 as Operable Unit One (OU1) of the CB/NT Superfund Site, which
8 addresses cleanup of ten to twelve (10-12) square miles of shallow
9 water, shoreline, and aquatic lands located in the industrial
10 tideflats area of the active commercial seaport of the City of
11 Tacoma. The marine boundaries of this OU1 are limited to the
12 shoreline/banks, intertidal areas, and bottom sediments.

13 10. On September 8, 1983, EPA placed the CB/NT Site on the
14 National Priorities List pursuant to Section 105 of CERCLA,
15 42 U.S.C. § 9605.

16 11. Under a Cooperative Agreement with EPA, the Washington
17 Department of Ecology (Ecology) conducted a Remedial Investigation
18 and Feasibility Study (RI/FS) of the CB/NT Site. Within the
19 Tideflats area of the CB/NT Site, the RI/FS evaluated the nature
20 and extent of contamination in the Sitcum, Blair, Milwaukee,
21 Hylebos, St. Paul, Middle, Thea Foss (formerly known as City), and
22 Wheeler-Osgood Waterways. The final RI/FS was made available for
23 public comment in February 1989.

24 12. Several contaminants were detected in the Mouth of the
25 Hylebos Waterway sediments, including, but not limited to,
26 polychlorinated biphenyls (PCBs), hexachlorobenzene,
27 trichloroethene, tetrachloroethene, 1,2-dichlorobenzene,

1 1,3-dichlorobenzene, hexachlorobutadiene, and lead, which in
2 certain forms are known to be toxic to humans and marine life and
3 are designated as hazardous substances under Section 102(a) of
4 CERCLA, as reported at 40 CFR Part 302.4.

5 13. Historic and existing waste streams both to groundwater
6 and directly to the Mouth of the Hylebos Waterway, were identified
7 as major sources of chlorinated organic compounds. Several
8 industrial and other facilities have served as sources of
9 contamination to sediments in the Mouth of Hylebos Waterway by
10 direct discharges to the Waterway or surface water runoff into the
11 Waterway.

12 14. Several contaminants were detected in the Head of the
13 Hylebos sediments including, but not limited to, PCBs, high
14 molecular weight polycyclic aromatic hydrocarbons (HPAHs), arsenic,
15 zinc, copper, antimony, lead, nickel, mercury, tetrachloroethene,
16 and phenol, which in certain forms are known to be toxic to humans
17 and marine life and are designated as hazardous substances under
18 Section 102(a) of CERCLA, as reported at 40 CFR Part 302.4.

19 15. Several historic and existing waste streams and disposal
20 activities and discharges from storm drains were identified as
21 among the potential sources of polycyclic aromatic hydrocarbons
22 (PAHs), PCBs, arsenic, copper, lead and zinc in the Head of Hylebos
23 Waterway. Such sources include: residues from sludge dewatering
24 operations; seepage of contaminated groundwater; storm water
25 runoff; and use of slag as ballast for several log sort yards
26 around the Head of the Hylebos Waterway.

1 16. The RI/FS evaluated contaminants detected at the CB/NT
2 Superfund Site to identify problem chemicals that pose the greatest
3 risk to human health and the environment. The technical approach
4 was to establish information relating specific chemicals to
5 biological effects in various aquatic organisms and to quantifiable
6 human health risks. Problem chemicals were defined as those
7 chemicals whose concentration exceeded the low apparent effects
8 threshold (AET) in a particular problem area. The AET was defined
9 as the contaminant concentration above which toxicity or benthic
10 effects are always observed in a data set developed specifically
11 for the Puget Sound using three biological effects tests: amphipod
12 mortality, oyster larvae abnormality, and benthic infaunal
13 depressions. Human health risks due to the ingestion of
14 contaminated seafood were estimated using risk assessment methods
15 and chemical concentrations detected in english sole muscle and
16 liver tissue and crab muscle tissue. PCBs were the only
17 contaminants for which the human health risk assessment showed a
18 greater risk than the environmental risk assessment. Sediment
19 Quality Objectives (SQOs) were developed as the cleanup standards
20 for the CB/NT site based on the low AET values for chemicals other
21 than PCBs, and based on the human health risk assessment and levels
22 found in Puget Sound reference areas for PCBs.

23 17. On September 29, 1989, EPA issued a Record of Decision
24 (ROD) that selected the remedy for remediation of sediments (OU 01)
25 and sources of contamination (OU 05) in eight (8) problem areas of
26 the Commencement Bay Nearshore/Tideflats (CB/NT) Superfund Site,
27 including the Head and Mouth of the Hylebos Waterway. In the ROD,

1 EPA determined that there are five major elements of the selected
2 remedy for the Site sediments and sources that will be applied, as
3 appropriate, to each problem area:

4 a. Site Use Restrictions - To protect human health by
5 limiting access to edible resources prior to and during
6 implementation of source and sediment remedial activities.

7 b. Source Controls - To be implemented to prevent
8 recontamination of sediments.

9 c. Natural Recovery - Included as a preferred remediation
10 strategy for marginally contaminated sediments that are predicted
11 to achieve acceptable sediment quality through either
12 biodegradation, or burial and mixing with naturally accumulating
13 clean sediments within a ten (10) year period.

14 d. Sediment Remedial Action - To address sediments
15 containing contamination that is not expected to naturally recover
16 within ten (10) years following implementation of all known,
17 available, and reasonable source control measures.. For those areas
18 in which natural recovery will not sufficiently reduce contaminant
19 concentrations within the ten (10) year period, the ROD required
20 active sediment cleanup using one of the following four
21 technologies: in-place capping, dredging and confined aquatic
22 disposal, dredging and nearshore disposal, or dredging and upland
23 disposal. The ROD expressed EPA's preference to utilize nearshore
24 disposal in conjunction with otherwise permissible commercial
25 development projects, and to minimize unnecessary impact to
26 nearshore habitat, consistent with the provisions of the Clean
27 Water Act (CWA). The disposal option is to be identified during

1 design of the remedial action.

2 e. Source and Sediment Monitoring - To refine cleanup
3 volume estimates, characterize the effectiveness of source
4 controls, and implement long-term monitoring of the sediment
5 remedial actions(s) to ensure long-term protectiveness of the
6 remedy.

7 18. Based on an evaluation of biological effects and human
8 health risks during the RI/FS, the ROD established SQOs at the AET
9 value for specific chemicals, as set forth in Table 5 of the ROD,
10 and in Table 2 of the attached Statement of Work (SOW). PCBs and
11 hexachlorobenzene, which were among the chemicals detected at the
12 Mouth of the Hylebos Waterway at levels exceeding the SQOs, were
13 selected as chemical indicators of biological effects and human
14 health risks at the Mouth because these chemicals were found at the
15 highest concentrations relative to SQOs over the greatest area.
16 The ROD established the SQOs at 150 (ug/kg dry weight) for PCBs and
17 22 (ug/kg dry weight) for hexachlorobenzene. The ROD also
18 determined that natural recovery will not sufficiently reduce
19 contaminant concentrations in areas of the Mouth of the Hylebos
20 Waterway within the ten (10) year period, so the ROD required
21 active sediment cleanup with one (1) of the four (4) technology
22 options as a component of the remedy. PCBs, arsenic and HPAH,
23 which were among the chemicals detected at the Head of the Hylebos
24 Waterway at levels exceeding the SQOs, were selected as chemical
25 indicators of biological effects and human health risks at the Head
26 because these chemicals were found at the highest concentrations
27 relative to SQOs over the greatest area. The ROD established the

1 SQOs at 150 (ug/kg dry weight) for PCBs, 57 (mg/kg dry weight) for
2 arsenic and 17,000 (ug/kg dry weight) for HPAH. The ROD also
3 determined that natural recovery will not sufficiently reduce
4 contaminant concentrations in areas of the Head of the Hylebos
5 Waterway within the ten (10) year period, so the ROD required
6 active sediment cleanup with one (1) of the four (4) technology
7 options as a component of the remedy for areas that are not
8 expected to naturally recover.

9 19. Occidental Chemical Corporation (Occidental) (formerly
10 Hooker Chemical and Plastics Corporation) owns and operates a
11 thirty-three (33) acre facility at the mouth of Hylebos Waterway at
12 605 Alexander Avenue. The facility has been continuously operated
13 since the 1920's by Occidental or its predecessors. The plant
14 currently manufactures chlorine, sodium hydroxide, calcium
15 chloride, and muriatic acid, and has manufactured ammonia, ammonium
16 hydroxide, trichloroethylene, perchloroethylene, sodium aluminate,
17 and aluminum chloride. From approximately 1929 to 1970, effluents
18 from chlorine production operations were discharged directly to the
19 Hylebos Waterway through the main plant outfall. Wastes from the
20 trichloroethylene and perchloroethylene production process were
21 either discharged to the Hylebos Waterway, disposed of at a deep-
22 water disposal site, temporarily held in on-site settling ponds, or
23 disposed of off-site. Due to past operating practices, soil and
24 groundwater under the facility contain chlorinated organic
25 compounds. Direct discharge of sludges and wastewaters as well as
26 the soil and groundwater are or were sources of contamination of
27 several organic compounds to the Hylebos Waterway. Several organic

1 compounds have been documented in sediments adjacent to the
2 Occidental facility.

3 20. Kaiser Aluminum & Chemical Corporation owns and
4 operates an aluminum production plant on a ninety-six (96) acre
5 site at 3400 Taylor Way, near the head of the Hylebos Waterway.
6 Kaiser acquired the facility in 1946, and except for a period
7 between 1958 and 1964, it has conducted operations continuously.
8 Kaiser operated a wet scrubber system to control hydrogen fluoride
9 gases from 1950 until 1974. Waters from this air pollution control
10 system were directed to settling basins on the plant property.
11 Sludges that collected in the bottom of the settling basins
12 contained HPAHs. Approximately 82,000 cubic yards of sludge were
13 deposited in the settling ponds. The "Kaiser Ditch," which flows
14 to the Head of Hylebos Waterway, at one time collected water from
15 these settling ponds and other properties in the area. PAHs have
16 been found in the "Kaiser Ditch" and in the Hylebos Waterway at the
17 "Kaiser Ditch" outfall. Discharges from the "Kaiser Ditch" are an
18 identified source of HPAH from the Kaiser facility to the Hylebos
19 Waterway.

20 21. Elf Atochem North America, Inc. is an owner and
21 operator of a plant which manufactures chlorine-based chemicals at
22 2901 Taylor Way, at the head of the Hylebos Waterway. From the
23 1940s until the 1970s, a predecessor corporation, Pennwalt
24 Corporation, manufactured arsenic-based pesticides at this
25 facility. Waste sludges from the arsenic-based pesticides were
26 landfilled on-site. In addition, contaminated wastewaters and
27 sludges have been disposed of in various on-site pits, moats, and
28 HYLEBOS ADMINISTRATIVE ORDER ON CONSENT - Page 13

1 lagoons. Seepage of contaminated groundwater and direct discharges
2 of plant process waters and surface water runoff have been
3 documented as a source of arsenic and other metals, and chlorinated
4 organic compounds to the Hylebos Waterway.

5 22. General Metals of Tacoma, Inc. owns and operates a
6 twenty-six (26) acre scrap metal recycling facility adjacent to the
7 head of the Hylebos Waterway located at 1902 Marine View Drive.
8 The scrap metal recycling operation consists primarily of the
9 purchase, preparation, processing, storage and shipments of ferrous
10 scrap of varying grades, including automobiles, home appliances and
11 other consumer goods containing steel. Transformers containing
12 PCBs were used to provide electrical power. Oils and lubricants
13 generated by the metals reclamation process are handled and stored
14 for recycling by General Metals. Surface soils have been
15 documented to contain elevated levels of PCBs, arsenic copper, lead
16 and zinc. Surface water (stormwater) on the facility was
17 documented in 1989 to contain elevated levels of PCBs, copper, lead
18 and zinc. Prior to 1988, stormwater at the facility was routed
19 through an oil/water separator that discharged to the Hylebos
20 Waterway. Pentachlorophenol has been documented in groundwater
21 beneath the plant. The groundwater discharges to the Hylebos
22 Waterway.

23 23. The Port of Tacoma is the owner of submerged aquatic
24 lands (i.e. subtidal marine sediments) within the Hylebos Waterway.
25 The Port is also an owner of several parcels of land surrounding
26 the Hylebos Waterway. The Port owns a large industrial yard at the
27 mouth of the Hylebos Waterway, located at 401 Alexander Avenue,
28 HYLEBOS ADMINISTRATIVE ORDER ON CONSENT - Page 14

1 with several current tenants, including a shipyard where copper,
2 lead, zinc and other metals have been released to the Hylebos
3 Waterway through direct discharge and surface water run-off. The
4 Port currently owns or is a past owner of parcels used as log sort
5 yards. The log sort yards operating on properties owned by the
6 Port used slag as ballast and are identified as sources of arsenic,
7 copper, lead and zinc into the Waterway from soil and sediment
8 contamination. The Port is a past owner of a property at 1670
9 Marine View Drive, where bank sediments are contaminated with
10 arsenic, PCBs, HPAHs, and other contaminants.

11 24. ASARCO, Inc. produced smelter slag used along the
12 Hylebos Waterway at numerous log sort yards, primarily between 1975
13 and 1980. The smelter slag contains arsenic, copper, lead, and
14 zinc. Surface water runoff from the log sort yards using the
15 smelter slag as ballast has been identified as a source of metals
16 to the Hylebos Waterway.

17 VI. CONCLUSIONS OF LAW AND DETERMINATIONS

18 Based upon the Findings of Fact in Section V, EPA makes the
19 following Conclusions of Law and Determinations, which Respondents
20 neither admit nor deny.

21 25. The Site is a facility as defined in Section 101(9) of
22 CERCLA, 42 U.S.C. § 9601(9).

23 26. Substances and constituents thereof at the Site, and
24 substances otherwise found at the Site and identified in
25 Paragraphs 12-15, and 18 above, are hazardous substance(s) as
26 defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14), or
27 constitute pollutant(s) or contaminant(s) which may present an

1 imminent and substantial danger to public health or welfare or the
2 environment, as set forth in Section 104(a)(1) of CERCLA, 42 U.S.C.
3 § 9604(a)(1).

4 27. The presence of hazardous substances or pollutants or
5 contaminants at the Site, or the past, present or potential
6 migration of hazardous substances or pollutants or contaminants at
7 or emanating from the Site, constitute an actual and/or threatened
8 release as defined in Section 101(22) of CERCLA, 42 U.S.C.
9 § 9601(22).

10 28. Respondents are persons as defined in Section 101(21) of
11 CERCLA, 42 U.S.C. § 9601(21).

12 29. Respondents are responsible parties under Section 107(a)
13 of CERCLA, 42 U.S.C. § 9607(a), and potentially responsible parties
14 within the meaning of Sections 104(a) and 122(d)(3) of CERCLA, 42
15 U.S.C. §§ 9604(a) and 9622(d)(3).

16 30. The actions required by this Order are necessary to
17 protect the public health or welfare or the environment, are in the
18 public interest, are consistent with CERCLA and the NCP, and will
19 expedite effective remedial action and minimize litigation.

20 21 VII. NOTICE TO STATE

22 31. By providing a copy of this Order to the State of
23 Washington through its Department of Ecology (Ecology), EPA is
24 notifying the State of Washington that this Order is being issued
25 and that EPA is the lead agency for coordinating, overseeing, and
26 enforcing the response action required by the Order.

VIII. WORK TO BE PERFORMED

32. All work performed pursuant to this Order shall be under the direction and supervision of qualified persons. Within thirty (30) days after the effective date of this Order, and before any work under this Order begins at the Site, Respondents shall submit in writing the names, titles, addresses, and qualifications of all personnel, including contractors, subcontractors, laboratories, and consultants to be used in performing activities pursuant to this Order to EPA. The qualifications of the persons and laboratories undertaking the work for Respondents shall be subject to EPA's review, for verification that such persons and laboratories meet minimum technical background, experience, and quality control requirements. EPA may inspect any laboratory used in performing activities pursuant to this Order to verify approved quality control procedures and protocols are maintained. If Respondents elect to use any additional contractors, subcontractors, or laboratories subsequent to commencement of activities at the Site, Respondents shall submit the information listed in this paragraph to EPA in writing at least ten (10) days prior to any such use. This Order is contingent on Respondents' demonstration to EPA's satisfaction that Respondents are qualified to perform properly and promptly the actions set forth in this Order. If EPA disapproves any of Respondents' contractors, subcontractors, or laboratories, Respondents shall make replacement selection(s) within thirty (30) days of receipt of written disapproval from EPA. If EPA subsequently disapproves of the replacement(s), EPA reserves the right to terminate this Order, conduct a complete RD and/or conduct

1 or authorize any other response activities it deems necessary, and
2 seek costs thereafter and penalties from Respondents. During the
3 course of the RD, Respondents shall notify EPA in writing of any
4 changes or additions in the persons used to carry out such work,
5 providing their names, titles and qualifications. EPA shall have
6 the same right to approve changes and additions to personnel as it
7 has hereunder regarding the initial notification.

8 33. The work by the Respondents pursuant to this Order shall
9 be designed to achieve the following standards at the Hylebos
10 Waterway:

11 a. Achieve the goals and performance standards of the ROD,
12 including the SQOs set forth in Table 2, and in Section I of the
13 SOW. If the ROD is amended or modified by EPA, Respondents shall
14 achieve the goals and performance standards of the ROD, as amended
15 or modified.

16 b. Propose a Remediation Plan that attains applicable or
17 relevant and appropriate substantive requirements, as defined in
18 the NCP.

19 34. Respondents shall conduct activities and submit
20 deliverables for EPA review, comment, approval or modification as
21 EPA may deem appropriate, as provided in the SOW, which is Appendix
22 I to this Order and is incorporated into, and made an enforceable
23 part of this Order by this reference. Respondents neither admit
24 nor deny any of the statements or conclusions in the SOW, but agree
25 to perform the work described therein. All such work shall be
26 conducted in accordance with the requirements of CERCLA, the NCP,
27 and all applicable EPA guidance, including, but not limited to, the
28 HYLEBOS ADMINISTRATIVE ORDER ON CONSENT - Page 18

1 EPA Superfund Remedial Design and Remedial Action Guidance (RD/RA
2 Guidance), guidances referenced therein, and guidances referenced
3 in the SOW, as may be amended or modified by EPA. Work conducted
4 in compliance with all requirements of this Order will be deemed
5 consistent with CERCLA and the NCP. The general activities
6 Respondents are required to perform are identified below, including
7 various deliverables to be submitted by Respondents for EPA review
8 and approval. The specific tasks Respondents shall perform are
9 described more fully in the SOW and guidances. All work performed
10 pursuant to this Order shall be in accordance with the schedules,
11 standards, specifications, and other requirements of this Order,
12 including the SOW, the Remedial Design Work Plan, and other
13 deliverables, as initially approved or modified by EPA, or as may
14 be amended or modified by EPA from time to time. The Schedule for
15 Submission of Major Deliverables, which is Table 1 to the SOW,
16 assumes a level of effort shown on Table 1A to the SOW, and
17 schedule deadlines will be extended or shortened if the
18 Respondents' level of effort falls above or below the assumptions
19 in Table 1A. For purposes of this Order, day means calendar day
20 unless otherwise noted in the Order.

21 a. Pre-Remedial Design Work Plan (Work Plan). Within
22 seventy-five (75) days of the effective date of this Order,
23 Respondents shall submit for EPA approval a Pre-Remedial Design
24 Work Plan containing the information required under Section
25 II.A.2.a. of the SOW.

b. Pre-Design Sampling and Analysis Plan (SAP), Quality Assurance Project Plan (QAPP) and Health and Safety Plan (HSP).

Within ninety (90) days of the effective date of this Order, Respondents shall submit for EPA approval a Pre-Design Sampling and Analysis Plan (SAP), a Design Quality Assurance Project Plan (QAPP), and a Pre-Design Health and Safety Plan (HSP). The SAP shall include all elements described in Section II.B.2.b. of the SOW. The QAPP shall include all elements described in Section II.B.2.c. of the SOW, and the HSP shall include all elements described in Section II.B.2.d. of the SOW. Within two hundred and forty (240) days after EPA approval of the Pre-Design SAP and QAPP, Respondents shall submit an addendum to the Pre-Design SAP for Round 1C sampling locations. Following EPA approval, or modification or revision as required by EPA, the SAP, any supplement to the SAP, the QAPP, and the HSP shall be incorporated in, and be an enforceable part of this Order.

c. Summary of Existing Information. Within one hundred twenty (120) days after EPA approval of the Work Plan, Respondents shall submit for EPA approval a Summary of Existing Information, containing the information required under Section II.B.2.a. of the SOW.

d. Disposal Site Inventory. Within one hundred and twenty (120) days after EPA approval of the Work Plan, Respondents shall submit for EPA approval a Disposal Site Inventory report that meets the requirement of Section II.B.2.e. of the SOW.

e. Pre-Design Data Reports.

i. Within one hundred and sixty (160) days after EPA's

1 approval of the Pre-Design SAP and QAPP, Respondents shall submit
2 for EPA approval a Technical Memorandum providing the Round 1A
3 validated data.

4 ii. Within two hundred and forty (240) days after EPA
5 approval of the Pre-Design SAP and QAPP, Respondents shall submit
6 for EPA approval Pre-Design Round 1A Data Report that provides the
7 results of the Round 1A pre-design sampling and analysis activities
8 that meets the requirements of Section II.B.2.f. of the SOW.

9 iii. On or before May 15, 1994, Respondents shall submit
10 for EPA approval the Round 1B SAP addendum.

11 iv. Within one hundred and ninety (190) days after EPA
12 approval of the Round 1B SAP Addendum, Respondents shall submit for
13 EPA approval a Technical Memorandum providing the Round 1B
14 validated data.

15 v. Within two hundred and sixty (260) days after EPA
16 approval of the Round 1B SAP addendum, Respondents shall submit for
17 EPA approval a Round 1B Addendum to the Pre-Design Data Report that
18 meets the requirements of Section II.B.2.f. of the SOW.

19 vi. Within one hundred and ninety (190) days after EPA
20 approval of the Round 1C SAP Addendum, Respondents shall submit for
21 EPA approval a Technical Memorandum providing the Round 1C
22 validated data.

23 vii. Within two hundred and sixty (260) days after EPA
24 approval of the Round 1C SAP addendum, Respondents shall submit for
25 EPA approval a Round 1B Addendum to the Pre-Design Data Report that
26 meets the requirements of Section II.B.2.f. of the SOW.

1 f. Round 1 Data Evaluation Report and Screening of Remedial
2 Action Alternatives. Within two hundred and sixty (260) days after
3 receipt of EPA comments on the Pre-Design Round 1A Data Report, or
4 within two hundred and sixty (260) days after receipt of EPA
5 approval of the Round 1C SAP addendum, whichever is later,
6 Respondents shall submit for EPA approval a Round 1 Data Evaluation
7 and a Screening of Remedial Action Alternatives Report containing
8 the information required under Section II.B.2.g.(1) of the SOW, and
9 Respondents shall submit for EPA approval Amendments to SAP, QAPP,
10 and HSP for Round 2 Sampling required under Section II.B.2.h. of
11 the SOW.

12 g. Round 2 Technical Memorandum. Within one hundred and
13 sixty (160) days after EPA approval of the Round 2 SAP Addendum,
14 Respondents shall submit for EPA approval a Technical Memorandum
15 providing the Round 2 validated data.

16 i. Round 2 Addendum to Pre-Design Data Report. Within two
17 hundred and forty (240) days after receipt of EPA approval of the
18 Round 2 SAP Addendum, Respondents shall submit for EPA approval a
19 Round 2 Addendum to the Pre-Design Data Report containing the
20 information required under Section II.B.2.f. of the SOW.

21 j. Pre-Design Evaluation Report. Within three hundred and
22 sixty (360) days after receipt of EPA approval of the Round 2 SAP
23 addendum and QAPP, Respondents shall submit for EPA approval a Pre-
24 Design Evaluation Report containing a proposed Remediation Plan and
25 other information required under Section II.B.2.g.(2) of the SOW.
26 Upon approval by EPA, this Report, including the proposed
27 Remediation Plan, will be published for review during a period for

1 public comment.

2 Following the period of public comment, EPA may select the
3 proposed Remediation Plan that was published for comment or require
4 Respondents to modify or revise the Pre-Design Evaluation Report or
5 proposed Remediation Plan prior to EPA approval. Upon approval by
6 EPA, the Pre-Design Evaluation Report and the selected Remediation
7 Plan shall be incorporated in, and be an enforceable part of this
8 Order.

9 k. It is acknowledged that Elf Atochem North America, Inc.,
10 ASARCO Inc., Kaiser Aluminum & Chemical Inc., Occidental Chemical
11 Corp., and other PRPs are negotiating with the federal, state and
12 tribal Natural Resource Trustee agencies (the Trustees) for the
13 CB/NT Site to finance or perform sampling and analysis that can be
14 used for natural resource damage assessment (NRDA) purposes. The
15 Port of Tacoma has resolved its liability for natural resource
16 damages in the Commencement Bay Environment. These parties agree
17 to use their best efforts to reach an agreement with the Trustees
18 that will coordinate sampling events, data collection and analysis
19 with the pre-remedial design sampling.

20 35. EPA reserves the right to comment on, modify, and
21 direct changes for all deliverables. At EPA's discretion,
22 Respondents shall fully correct all deficiencies and incorporate
23 and integrate all information and comments supplied by EPA either
24 in subsequent or resubmitted deliverables. For each and every
25 deliverable, report, memorandum, plan, or other item required under
26 this Order, if EPA disapproves or requires modification or revision
27 of any deliverable, report, memorandum, plan, or other item, in

1 whole or in part, Respondents shall submit a modified or revised
2 version thereof to EPA which is responsive to all EPA directions,
3 comments, or requirements within thirty (30) days after receiving
4 such directions, comments or requirements from EPA, unless a
5 shorter or longer time is specified by EPA.

6 36. EPA reserves the right to stop Respondents from
7 proceeding at any time, either temporarily or permanently, on any
8 task(s), activity(s) or deliverable(s) at or relating to the Site
9 and/or the implementation of this Order.

10 37. If Respondents modify or revise any deliverable, report,
11 plan, or other submittal after receipt of EPA comments, directions,
12 or requirements, and EPA subsequently disapproves the revised
13 submittal, or if subsequent submittals do not, in EPA's judgment,
14 adequately address EPA's comments, directions or requirements for
15 changes, EPA may seek stipulated or statutory penalties from
16 Respondents for violation of this Order; perform its own studies;
17 complete the PRD, RD, or any portion of the RD; and/or take any
18 response action at the Site it deems necessary, in accordance with
19 its authority, and seek reimbursement from Respondents for its
20 costs therefor; and/or seek any other appropriate relief, subject
21 to Respondents' right to invoke all remedies and defenses,
22 including dispute resolution as provided in Section XVII.

23 38. In the event EPA takes over or causes others to perform
24 some tasks, but does not remove Respondents' duty to complete the
25 PRD pursuant to this Order, Respondents shall incorporate and
26 integrate information supplied by EPA as directed by EPA.

27 39. The absence of express EPA comment, approval or
28 HYLEBOS ADMINISTRATIVE ORDER ON CONSENT - Page 24

1 disapproval of any submission within any specified time period
2 shall not be construed as approval by EPA. Respondents are
3 responsible for the timely preparation of deliverables acceptable
4 to EPA.

5 40. Respondents shall, prior to the shipment of hazardous
6 substances from the Site to an out-of-state waste management
7 facility, submit written notification, as set forth below, to the
8 appropriate state environmental official in the receiving state,
9 and to the EPA Project Coordinator. This notification requirement
10 shall not apply when the total volume of such a shipment will not
11 exceed ten (10) cubic yards. Notification shall be in writing and
12 shall include: 1) the name and location of the receiving facility;
13 (2) the type and quantity of hazardous substances to be shipped;
14 (3) the expected shipment schedule; and (4) the mode of
15 transportation. Respondents shall submit written notification of
16 any changes in the shipment plan such as a decision to ship the
17 hazardous substances to another facility within the same state, or
18 to a facility in another state. Notification of the selection of
19 the receiving facility and state shall be made at least thirty (30)
20 days before any hazardous substances are actually shipped.

21 IX. MODIFICATION OF THE WORK PLAN

22 41. a. If, at any time, Respondents identify a need for
23 additional data, Respondents shall submit a memorandum to the EPA
24 Project Coordinator within twenty (20) days after such need has
25 been identified explaining the need for and the nature of the data
26 sought. EPA, in its discretion, will determine whether the
27 additional data proposed to be collected by Respondents shall be

1 incorporated into reports and deliverables. Additional work
2 conducted by Respondents that is determined to be appropriate for
3 the PRD pursuant to this Paragraph and approved by EPA, shall be
4 deemed to be consistent with CERCLA, the NCP, and applicable EPA
5 guidance.

6 b. Respondents are seeking ways to achieve an expedited,
7 cost-effective cleanup of the Hylebos Waterway that is protective
8 of human health and the environment, is consistent with the NCP,
9 and complies with the ROD, as may be amended by EPA. The Port of
10 Tacoma is considering whether to apply for a permit under Section
11 404 of the Clean Water Act for a development project to create a
12 nearshore fill for a marine terminal at a location in the Blair
13 Waterway known as "Slip One." Based on the results of Round 1A,
14 Respondents may propose an expedited cleanup of the Hylebos
15 Waterway that utilizes the "Slip One" site for disposal of the
16 contaminated sediments from the Hylebos Waterway. EPA will
17 consider integrating the proposed "Slip One" development project
18 with the requirements of this AOC and SOW if the proposal
19 incorporates appropriate compensatory mitigation and addresses the
20 existing mitigation site in "Slip One." If this approach is
21 considered feasible by EPA, after consultation with the U.S. Army
22 Corps of Engineers and the resource agencies, and if EPA and
23 Respondents can agree on the requirements necessary to fully
24 evaluate and expedite the proposal, the AOC and the SOW may be
25 modified to incorporate that agreement.

26 42. In addition to the requirements of Section 103 of CERCLA,
27 42 U.S.C. § 9603, and all other statutory or regulatory reporting
28 HYLEBOS ADMINISTRATIVE ORDER ON CONSENT - Page 26

1 requirements, Respondents shall immediately notify EPA and Ecology
2 of any conditions at the Site which may pose an immediate threat to
3 human health or welfare or the environment. In the event of
4 unanticipated conditions or changed circumstances at the Site,
5 Respondents shall notify the EPA Project Coordinator by telephone
6 within twenty-four (24) hours of discovery of the unanticipated or
7 changed circumstances. If, for any reason, the EPA Project
8 Coordinator cannot be reached, Respondents shall as immediately as
9 possible thereafter notify the EPA Region 10 Superfund Branch
10 Chief, or leave detailed messages with both of their respective
11 offices if neither can be reached. In addition to the authorities
12 of the NCP, EPA may modify or amend any work to be performed
13 pursuant to this Order or require additional work if EPA determines
14 that such modification or amendment is warranted by the immediate
15 threat or in response to unanticipated conditions or changed
16 circumstances threatening human health or the environment.
17 Respondents shall perform such modified or additional work.

18 43. EPA may determine that in addition to tasks defined in
19 the SOW and in the approved Remedial Design Work Plan, other
20 additional work may be necessary to accomplish the objectives of
21 the PRD as set forth in the ROD, as the ROD may be amended or
22 modified by EPA, this Order, and the SOW. EPA may require
23 Respondents to perform such additional work or other response
24 activity in addition to the work initially approved or modified, if
25 EPA determines that such actions are necessary for a complete PRD.
26 Respondents shall confirm their willingness to perform any such
27 additional work in writing within seven (7) days after receipt of

1 the EPA request, or properly invoke the dispute resolution
2 procedures set forth in Section XVII of this Order. Subject to the
3 resolution of any dispute, Respondents shall implement the
4 additional tasks EPA determines are necessary. The additional work
5 shall be completed according to the standards, specifications, and
6 schedule set forth or approved by EPA in a written work plan
7 modification or written work plan supplement. EPA reserves the
8 right to conduct all or part of such work itself, to seek
9 reimbursement of costs from Respondents, and/or to seek any other
10 appropriate relief.

11 X. QUALITY ASSURANCE

12 44. Respondents shall assure that all work performed,
13 samples taken and analyses conducted, conform to the requirements
14 of the SOW, the QAPP approved by EPA, and guidances identified
15 therein, and that all field personnel shall be properly trained for
16 each task they may perform and in the use of field equipment,
17 including strict adherence to EPA chain-of-custody procedures.

18 XI. PROPOSED REMEDIATION PLAN, PUBLIC COMMENT,
19 ADMINISTRATIVE RECORD

20 45. EPA retains full authority and responsibility for all
21 aspects of public participation as set forth in CERCLA and the NCP,
22 or as EPA may deem appropriate, including the release to the public
23 of the Pre-Design Evaluation Report, with the proposed Remediation
24 Plan. As requested by EPA, Respondents shall provide information
25 supporting EPA's community relations programs related to the Site,
26 and shall participate in public meetings which may be held or
27 sponsored by EPA to explain activities at or concerning the Site.

1 46. EPA will determine the contents of the administrative
2 record file for the selection of remedial action. Respondents do
3 not waive any rights or claims they may have regarding the adequacy
4 of the administrative record. Respondents shall submit documents
5 developed pursuant to this Order to EPA upon which approval of the
6 proposed Remediation Plan may be based. Upon request by EPA,
7 Respondents shall submit copies of plans, task memoranda, including
8 all documentation of field modifications, recommendations for
9 further action, quality assurance memoranda and audits, raw data,
10 field notes, laboratory analytical reports, and other reports to
11 EPA. Respondents shall also submit any previous studies conducted
12 under state, local or other federal authorities relating to
13 response selection, and all communications between Respondents and
14 state, local, or other federal authorities concerning response
15 selection. EPA shall maintain a community information repository
16 at or near the Site to house a copy of the administrative record.

17 XII. PROGRESS REPORTS AND MEETINGS

18 47. Respondents shall make presentations at, and participate
19 in, meetings and telephone conferences at the request of EPA during
20 the initiation, conduct, and completion of the PRD. In addition to
21 discussion of the technical aspects of the PRD, topics will include
22 anticipated problems or new issues. Meetings and telephone
23 conferences will be scheduled at EPA's discretion.

24 48. In addition to the deliverables set forth in this Order,
25 until the termination of this Order, Respondents shall provide
26 monthly progress reports to EPA by the 10th day of each month
27 following the effective date of this Order. These progress reports

1 shall: (1) describe the actions which have been taken to comply
2 with this Order during the previous month; (2) list all sampling
3 and test results and all other data reports received by the
4 Respondents in the previous month; (3) describe all work planned
5 for the next month with schedules relating such work to the overall
6 project schedule, including percentage of completion data; (4)
7 describe all problems encountered and any anticipated problems, any
8 actual or anticipated delays, and all solutions developed and
9 implemented or planned to address any actual or anticipated
10 problems or delays; and (5) include all other elements specified in
11 Section II.A.2.b. of the SOW.

12 XIII: SAMPLING, ACCESS, AND DATA AVAILABILITY/ADMISSIBILITY

13 49. Tabular summaries of all results of sampling, tests,
14 modeling or other data generated by Respondents, or on Respondents'
15 behalf, during implementation of this Order, shall be submitted to
16 EPA in the subsequent monthly progress report as described in
17 Section XII of this Order. All laboratory data and all laboratory
18 analytical reports shall be submitted to EPA upon its request, and
19 EPA will treat unvalidated data as confidential enforcement
20 material exempt from disclosure under 5 U.S.C. § 552(b)(7) until
21 the validated data results are available. EPA will make available
22 to the Respondents validated data generated by EPA pursuant to
23 Paragraph 50.

24 50. Respondents shall notify EPA, Ecology, and the Trustees
25 representatives designated in Section XIV of this Order at least
26 fourteen (14) days prior to conducting any field events described
27 in the SOW, any approved work plan, or sampling and analysis plan.

1 At EPA's verbal or written request, or the request of their Project
2 Coordinators or designees, Respondents shall allow split or
3 duplicate samples to be taken by EPA and Ecology and their
4 authorized representatives and designees of any samples collected
5 by the Respondents in implementing this Order.

6 51. EPA, Ecology and the Trustees and their designated
7 representatives, shall have full access to, and authority to freely
8 move about all property at the Site and off-Site areas where work
9 is to be carried out pursuant to this Order. EPA and Ecology and
10 their designated representatives, also shall have such full access,
11 including to laboratories, for purposes of inspecting conditions,
12 activities in implementing the requirements of this Order, records,
13 operating logs, and contracts related to the Site or Respondents or
14 its contractor related to work carried out under this Order;
15 reviewing the progress of the Respondents in carrying out the terms
16 of this Order; conducting tests as they or their authorized
17 representatives or designees deem necessary; using a camera, sound
18 recording device or other documentary type equipment; and verifying
19 the data submitted to them by the Respondents. The Respondents
20 shall allow these persons to inspect and copy all non-privileged
21 records, files, photographs, documents, sampling and monitoring
22 data, and other writings related to work undertaken in carrying out
23 this Order. Copies of all other information or records created,
24 maintained or received by Respondents or its agents, employees,
25 accountants, contractors or consultants which are prepared pursuant
26 to this Order, including but not limited to: contractual
27 documents, work orders, disposal records, and any other records or

1 documents not previously required herein shall promptly be made
2 available to EPA on request as soon as practicable, but in any
3 event within thirty (30) days of Respondents' receipt of EPA's
4 request. Nothing herein shall be interpreted as limiting or
5 affecting EPA's right of entry or inspection authority under
6 federal law. All persons with access to the Site under this
7 paragraph shall comply with all approved health and safety plans.

8 52. Respondents may assert a claim of business
9 confidentiality covering part or all of the information submitted
10 to EPA pursuant to this Order in accordance with Section 104(e)(7)
11 of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. Part 2, Subpart B.
12 This claim shall be asserted in the manner described by 40 C.F.R.
13 2.203(b), and substantiated when made. If no such claim
14 accompanies the information when it is submitted to EPA, it may be
15 made available to the public by EPA without further notice to
16 Respondents.

17 53. Respondents reserve their right to assert privilege and
18 work-product protections as to opinions and conclusions of their
19 employees, consultants, attorneys, or other agents that were
20 generated at the request of the attorney in anticipation of
21 litigation. In the event privilege is asserted, upon request,
22 Respondents shall provide EPA with the date, author, recipient, or
23 addressee, title, or description of the subject of the opinion or
24 conclusion and the privilege asserted by Respondents.

25 54. Respondents shall not object to any use of any data
26 gathered, generated, or evaluated by EPA, Ecology, or Respondents
27 in the performance or oversight of any work which has been verified

1 according to the quality assurance/quality control (QA/QC)
2 procedures required by this Order or any EPA-approved work plan or
3 sampling and analysis plan, or which is contained in a report
4 submitted by Respondents and approved by EPA under this Order. If
5 Respondents object to any use of any other data relating to the
6 PRD, Respondents shall submit a report to EPA which identifies and
7 explains Respondents' objections, describes any proposed acceptable
8 uses of the data, and specifically identifies any proposed
9 limitations on the use of the data. This report must be submitted
10 to EPA within thirty (30) after such data's use is made known to
11 Respondents, or Respondents' opportunity to object to such data
12 shall be waived.

13 55. If the Site areas that are to be used for access or are
14 within the scope of the PRD, are owned in whole or in part by
15 parties other than Respondents or the United States, Respondents
16 shall obtain, or use their best efforts to obtain, written site
17 access agreement(s) from the present owner(s) not less than ninety
18 (90) days prior to a field sampling event that will require access.
19 Such agreement(s) shall provide access for EPA and Ecology, and
20 their representatives and designees, and Respondents and their
21 authorized representatives, and shall specify that Respondents are
22 not the governments' representatives with respect to any liability
23 associated with activities required by this Order. Copies of all
24 such agreements shall be provided to EPA prior to the initiation of
25 any field activities. If Respondents are unable to obtain access
26 agreements within the time referenced above, Respondents shall
27 immediately notify EPA of their failure to obtain access. EPA will

1 extend the schedule or modify the SAP, if deemed necessary by EPA,
2 if delays in performance of work will result from the Respondents'
3 inability to obtain access agreements to a location deemed
4 necessary by EPA after Respondents have used best efforts and
5 notified EPA in a timely manner, as specified in this Paragraph.
6 EPA may obtain access for Respondents, or perform tasks or
7 activities under its own authority in the event Respondents cannot
8 obtain access agreements. In the event EPA performs any tasks or
9 activities and does not terminate this Order, Respondents shall
10 perform all other activities not requiring such access, and shall
11 reimburse EPA for all costs EPA incurs in performing any tasks or
12 activities. Respondents shall integrate the results of any tasks
13 or activities undertaken by EPA into Respondents' deliverables.
14 Furthermore, the Respondents agree to indemnify the United States
15 for any liability arising out of the performance of any such tasks
16 or activities by EPA to the extent set forth in Paragraph 95 of
17 this Order. Respondents shall also reimburse EPA for all costs and
18 attorney fees incurred by the United States to obtain access
19 pursuant to this Order.

20 XIV. DESIGNATED PROJECT COORDINATORS, NOTICES AND SUBMISSIONS

21 56. Within thirty (30) days after the effective date of this
22 Order, Respondents (collectively) shall designate a Project
23 Coordinator. EPA's designated Project Coordinator is Allison
24 Hiltner. Each Project Coordinator shall be responsible for
25 overseeing the implementation of this Order. Respondents' Project
26 Coordinator shall have experience in designing, conducting or
27 overseeing dredging projects involving contaminated sediments. To

1 the extent possible, communications between Respondents and EPA
2 shall be directed to the Project Coordinators by mail, with copies
3 to such other persons as EPA may designate. Communications
4 include, but are not limited to, all documents, reports, approvals,
5 and other correspondence submitted under this Order.

6 57. Within thirty (30) days after the effective date of this
7 Order, Respondents shall submit the name, title, qualifications,
8 experience, professional affiliations, and background, of the
9 individual selected as Respondents' Project Coordinator to EPA in
10 writing. EPA and the Respondents have the right to change their
11 respective Project Coordinator. The other party must be notified
12 in writing at least ten (10) days prior to the change.

13 58. EPA's Project Coordinator shall have the authority
14 lawfully vested in a Remedial Project Manager (RPM) and On-Scene
15 Coordinator (OSC) by the NCP, and shall have the authority, in
16 accordance with the requirements of the NCP, to halt any work
17 required by this Order and to take any necessary response action
18 when he or she determines conditions at the Site may present an
19 imminent and substantial endangerment to the public health or
20 welfare or the environment. The absence of the EPA Project
21 Coordinator from the area under study pursuant to this Order shall
22 not be cause for any stoppage or delay of any work.

23 59. EPA will arrange for a qualified person to assist in its
24 oversight and review of the conduct of the PRD, as authorized by
25 Section 104(a) of CERCLA, 42 U.S.C. § 9604(a). The oversight
26 assistant may observe work and make inquiries in the absence of
27 EPA, but is not authorized to modify any work plan.

1 60. Documents including work plans, reports, approvals,
2 disapprovals, and other correspondence which must be submitted
3 under this Order, shall be sent to the individuals at the addresses
4 specified below, unless those individuals give written notice of a
5 change to the other parties. All notices and submissions shall be
6 considered effective one business day after receipt by Respondents'
7 Project Coordinator, unless otherwise provided.

8 a. Six (6) copies of documents to be submitted to EPA shall
9 be forwarded to:

10 Allison Hiltner, HW-113,
11 U.S. EPA, Region 10
12 1200 Sixth Avenue
 Seattle, WA 98101

13 b. One (1) copy of documents to be submitted to EPA shall
14 be forwarded to:

15 Russell McMillan
16 Washington Department of Ecology
17 Southwest Regional Office
 P.O. Box 47775
 Olympia, Washington 98504

18 c. One (1) copy of documents to be submitted to EPA shall
19 be forwarded to:

20 Robert A. Taylor
21 National Oceanic and Atmospheric Administration
22 Damage Assessment and Restoration Center
 7600 Sand Point Way NW, BIN C15700
 Seattle, Washington 98115

23 d. Documents to be sent to Respondents shall be forwarded
24 to:

25 Paul Fuglevand
26 Dalton, Olmsted & Fuglevand, Inc.
27 19017 120th Ave. N.E., #107
 Bothell, Washington 98011

1 XV. OTHER APPLICABLE LAWS

2 61. All actions required to be taken pursuant to this Order
3 shall be performed in accordance with the requirements of all
4 applicable local, state, and federal laws and regulations. No
5 local, state, or federal permit shall be required for any portion
6 of any activity pursuant to this Order conducted entirely on-Site.
7 Off-Site disposal of hazardous substances shall comply with all
8 applicable provisions of CERCLA, RCRA, CWA the implementing
9 regulations respectively thereunder, and EPA guidances and
10 policies.

11 XVI. RECORD PRESERVATION

12 62. All records and documents created by Respondents, or on
13 Respondents' behalf, which relate in any way to the implementation
14 of this Order, shall be preserved by Respondents for a minimum of
15 ten (10) years after commencement of construction of any remedial
16 action at the Site. After this ten (10) year period, Respondents
17 shall notify EPA at least ninety (90) days before any records are
18 scheduled to be destroyed. If EPA requests that the documents be
19 saved, Respondents shall, at no cost to EPA, give EPA the documents
20 or true and accurate copies of the documents.

21 XVII. DISPUTE RESOLUTION

22 63. a. Any dispute which arises under or with respect to
23 this Consent Order shall, in the first instance, be the subject of
24 informal negotiations between the Respondents and EPA. The period
25 for informal negotiations shall not exceed fifteen (15) days from
26 the time the dispute arises, unless such period is modified by
27 written agreement of the Respondents and EPA. The dispute shall be

1 considered to have arisen when one (1) party sends the other party a
2 written Notice of Dispute. In the event that the parties cannot
3 resolve a dispute informally, the position advanced by EPA shall be
4 binding unless formal dispute resolution is available and invoked
5 under Subparagraph b. The dispute resolution procedures of this
6 section shall be the exclusive mechanism to resolve disputes arising
7 under or with respect to this Consent Order. The fact that dispute
8 resolution is not specifically referenced in a section of the Consent
9 Order does not bar Respondents from invoking the procedures with
10 respect to any matter in dispute.

11 b. Within twenty (20) days after the conclusion of the
12 informal negotiation period, Respondents may request a determination
13 by EPA's Branch Chief of the Superfund Remedial Branch in the
14 Hazardous Waste Division by submitting to EPA a written Statement of
15 Position on the matter in dispute, including, but not limited to, any
16 factual data, analysis, or opinion supporting that position and any
17 supporting documentation relied upon by the Respondents.

18 c. Within twenty (20) days after receipt of the
19 Respondents' Statement of Position, EPA will provide to Respondents
20 its Statement of Position, including, but not limited to, any factual
21 data, analysis, or opinion supporting that position and any supporting
22 documentation relied upon by EPA. If EPA does not provide its
23 Statement of Position within twenty (20) days, stipulated penalties
24 shall not accrue beyond the 20th day and until EPA has provided its
25 Statement of Position. If Respondents do not agree with the decision
26 of the Superfund Remedial Branch Chief, within seven (7) days of
27 receiving such decision, Respondents may request a determination by

1 EPA Region 10's Division Director, Hazardous Waste Division.

2 d. An administrative record of the dispute shall be
3 maintained by EPA and shall contain all Statements of Position,
4 including supporting documentation, submitted pursuant to this
5 section. Where appropriate, EPA may allow submission of supplemental
6 Statements of Position by the parties to the dispute.

7 e. Within twenty (20) days after receipt of the
8 Respondents' request for a determination, the Hazardous Waste Division
9 Director will issue a final administrative decision resolving the
10 dispute based on the administrative record described in Subparagraph
11 d. If EPA does not provide its final administrative decision within
12 twenty (20) days, stipulated penalties shall not accrue beyond the
13 20th day and until EPA has provided its final administrative decision.
14 This decision shall be binding upon the Respondents unless, in
15 response to Respondents' failure to comply, EPA seeks to enforce the
16 Order in court and Respondents prevail on judicial review as provided
17 in Paragraph 64.

18 64. If the Respondents do not comply with EPA's final
19 administrative decision, EPA reserves the right, in its sole
20 discretion, to seek either stipulated or statutory penalties from
21 Respondents for violation of the Order, conduct the PRD or RD, or any
22 portion of RD, and/or to pursue any other enforcement option provided
23 in CERCLA. If EPA seeks to enforce this Consent Order in court,
24 Respondents may seek judicial review of EPA's final administrative
25 decision based on the administrative record developed during the
26 dispute resolution process. Any judicial review of the dispute shall
27 be under the arbitrary and capricious standard.

1 65. While a matter is pending in dispute resolution,
2 Respondents are not relieved of their obligations to perform other
3 activities and submit deliverables in accordance with the schedules
4 incorporated into or developed under this Order. The invocation of
5 dispute resolution does not stay the accrual of stipulated or
6 statutory penalties under this Consent Order.

7 XVIII. STIPULATED PENALTIES

8 66. For each day that Respondents fail to complete a designated
9 deliverable in a timely manner, fail to produce a designated
10 deliverable of acceptable quality to EPA, or otherwise fail to perform
11 in accordance with the requirements of this Order, Respondents shall
12 be liable for stipulated penalties in accordance with this section.
13 Penalties for late submittals shall accrue from the due date and
14 extend until received. If EPA approves a timely request for a
15 schedule extension, accrual of penalties will be calculated from the
16 date provided for in the revised schedule. EPA will provide written
17 notice for violations that are not based on timeliness. Penalties for
18 violations that are not based on timeliness shall accrue from the date
19 of the written notice indicating the violation has occurred and extend
20 through the period of correction. Where a revised submission by
21 Respondents is required, stipulated penalties shall accrue from
22 receipt of notice until a satisfactory deliverable is produced.
23 Payment shall be due within thirty (30) days after receipt of a demand
24 letter from EPA.

25 67. Respondents shall pay interest on the unpaid balance, which
26 shall begin to accrue at the end of the thirty (30) day period, at the
27 rate established by the Department of Treasury pursuant to 30 U.S.C.

1 § 3717. Respondents shall further pay a handling charge of one (1)
2 percent, to be assessed at the end of each thirty-one (31) day period,
3 and a six (6) percent per annum penalty charge, to be assessed if the
4 penalty is not paid in full within ninety (90) days after it is due.

5 68. Respondents shall make all payments by forwarding a check to:

6 U.S. Environmental Protection Agency
7 Region 10 Superfund Accounting
8 P.O. Box 360903M
9 Pittsburgh, Pennsylvania 15251

10 Checks should state the name of the Site, the Site identification
11 number, the account number, and the title and docket number of this
12 Order. A copy of the check and accompanying transmittal letter shall
13 be forwarded to the EPA Project Coordinator.

14 69. For the submission of draft and revised major deliverables
15 described in Paragraph 34 of this Order, stipulated penalties shall
16 accrue in the amount of \$750.00 per day, per violation, for the first
17 seven (7) days of noncompliance; \$1,250.00 per day, per violation,
18 for the eighth (8th) through fourteenth (14th) day of noncompliance;
19 \$2,500.00 per day, per violation, for the fifteenth (15th) day through
20 the thirtieth (30th) day; and \$5,000.00 per day, per violation, for
21 the thirtieth (30th) day and beyond.

22 70. For the monthly progress reports, and for any failure to
23 perform in accordance with the requirements of this Order,
24 stipulated penalties shall accrue in the amount of \$300.00 per
25 day, per violation, for the first seven (7) days of noncompliance;
26 \$750.00 per day, per violation, for the eighth (8th) through
27 fourteenth (14th) day of noncompliance; \$1,750.00 per day, per
28 violation, for the fifteenth (15th) day through the thirtieth

1 (30th) day; and \$3,000.00 per day, per violation, for the thirtieth
2 (30th) day and beyond.

3 71. Respondents may dispute EPA's right to the stated amount
4 of penalties by invoking the dispute resolution procedures under
5 Section XVII herein. Penalties shall accrue but need not be paid
6 during a properly invoked dispute resolution period. If
7 Respondents do not prevail upon resolution, all penalties shall be
8 due within thirty (30) days after resolution of the dispute. If
9 Respondents prevail upon resolution, no penalties shall be paid.

10 72. In the event EPA provides for corrections to be reflected
11 in the next deliverable and does not require resubmission of the
12 initial deliverable, stipulated penalties for the initial
13 deliverable shall cease to accrue on the day of such decision by
14 EPA. Stipulated penalties for failure to produce a deliverable of
15 acceptable quality as an initial submission of that deliverable
16 shall accrue from receipt of notice, but shall not be payable
17 unless the resubmission is disapproved, as provided in Paragraph
18 37.

19 73. a. The stipulated penalties provisions of this Order do
20 not preclude EPA from pursuing any other remedies or sanctions
21 which are available to EPA because of the Respondents' failure to
22 comply with this Order, including but not limited to conduct of all
23 or part of the PRD by EPA. Payment of stipulated penalties does
24 not alter Respondents' obligation to complete performance under
25 this Order.

26 b. The stipulated penalties established in this Order
27 shall be the exclusive mechanism for the assesement and collection

1 of penalties for noncompliance with the provisions subject to
2 stipulated penalties, unless EPA elects, in lieu of demanding such
3 stipulated penalties, to seek civil penalties under CERCLA.

4 XIX. FORCE MAJEURE

5 74. Force majeure, for purposes of this Order, is defined as
6 any event arising from causes beyond the control of Respondents or
7 any entity controlled by Respondents, including Respondents'
8 agents, consultants, contractors and subcontractors, which delays
9 the timely performance of any obligation under this Order
10 notwithstanding Respondents' best efforts to avoid such delay. The
11 requirement that Respondents use best efforts to avoid the delay
12 includes using best efforts to anticipate potential force majeure
13 events and using best efforts to address the effects of any force
14 majeure event: (1) as it is occurring; and (2) following the
15 potential force majeure event, such that the delay is minimized to
16 the greatest extent practicable. Examples of events that are not
17 force majeure events include, but are not limited to, increased
18 costs or expenses of any work to be performed under this Order, or
19 the financial difficulty of Respondents to perform any such work.

20 75. If any event occurs or has occurred which may delay the
21 performance of any obligation under this Order, regardless of
22 whether caused by a force majeure event, Respondents shall verbally
23 notify the EPA Project Coordinator or, in his or her absence, the
24 Chief of the Superfund Branch, EPA Region 10, within
25 forty-eight (48) hours after Respondents knew that any event would
26 cause a delay. Within seven (7) days thereafter, Respondents shall
27 provide in writing the reasons for the delay; the anticipated

1 duration of the delay; all actions taken or to be taken to prevent
2 or minimize the delay; a schedule for the implementation of any
3 measures to be taken to mitigate the effect of the delay; and a
4 statement as to whether Respondents believe the event may cause or
5 contribute to an endangerment to public health, welfare or the
6 environment. Respondents shall exercise best efforts to avoid or
7 minimize any delay and any effects of any delay. Failure to comply
8 with the above requirements shall preclude Respondents from
9 asserting any claim of force majeure.

10 76. If EPA agrees that the delay or anticipated delay is
11 attributable to force majeure, the time for performance of the
12 obligations under this Order that are directly affected by the
13 force majeure event shall be extended by EPA for a period not to
14 exceed the actual duration of the delay attributed to the force
15 majeure event. An extension of the time for performance of the
16 obligation directly affected by the force majeure event shall not
17 extend the time for performance of any other unrelated obligations.

18 77. If EPA does not agree that the delay or anticipated delay
19 has been or will be caused by a force majeure event, or does not
20 agree with Respondents as to the appropriate length of any
21 extension due to force majeure, the issue shall be subject to the
22 dispute resolution procedures set forth in Section XVII of this
23 Order. In dispute resolution, Respondents shall have the burden of
24 demonstrating by a preponderance of the evidence that the delay or
25 anticipated delay has been or will be caused by a force majeure
26 event, that the duration of the delay was or will be warranted
27 under the circumstances, that Respondents did exercise or is

1 exercising due diligence by using its best efforts to avoid and
2 mitigate the effects of the delay, and that Respondents have
3 complied with all of the requirements of Paragraph 75 above.

4 78. Should Respondents carry the burden set forth in
5 Paragraph 77, the delay at issue shall be deemed not to be a
6 violation of the affected obligation of this Order.

7 XX. REIMBURSEMENT OF RESPONSE AND OVERSIGHT COSTS

8 79. Following the issuance of this Order, EPA shall submit to
9 the Respondents on an annual basis an accounting of all response
10 costs, including oversight costs, incurred by the United States
11 which relate to the PRD work under this Order. Such response costs
12 may include, but are not limited to, costs incurred by the United
13 States in overseeing Respondents' implementation of the
14 requirements of this Order, activities performed by the United
15 States as part of the PRD, including any costs incurred to obtain
16 access, and area-wide costs attributable to the Hylebos Waterway,
17 such as, community relations, source control activities, and PRP
18 search costs. Additionally, costs shall include all direct and
19 indirect costs, including but not limited to, time and travel costs
20 of EPA personnel and associated indirect costs, contractor costs,
21 cooperative agreement costs, compliance monitoring, including the
22 collection and analysis of split samples, inspection of RD
23 activities, Site visits, discussions regarding disputes that may
24 arise regarding this Order, review and approval or disapproval of
25 submissions, and costs of doing or redoing any of Respondents'
26 tasks. Summaries, including EPA's certified Agency Financial
27 Management System summary data (SCORES Reports), or such other

1 summary as certified by EPA, shall serve as a basis for payment
2 demands by EPA.

3 80. Respondents shall within thirty (30) days of receipt of
4 each accounting provided in Paragraph 79 above, remit a certified
5 or cashier's check for the amount of costs set forth in EPA's
6 accounting. Interest shall accrue from the later of: the date
7 payment of a specified amount is demanded in writing; or the date
8 of the expenditure. The interest rate shall be the rate of
9 interest on investments for the Hazardous Substances Superfund in
10 Section 107(a) of CERCLA, 42 U.S.C. § 9607(a).

11 81. Checks in payment of Response and Oversight Costs should
12 be made payable to the Hazardous Substances Superfund and should
13 state the name of the Site, the Site identification number, the
14 account number, and the title and docket number of this Order.
15 Checks should be forwarded to:

16 U.S. Environmental Protection Agency
17 EPA Region 10 Superfund Accounting
18 P.O. Box 360903M
Pittsburgh, Pennsylvania 15251

19 82. Copies of the transmittal letter and check should be sent
20 simultaneously to the EPA Project Coordinator and Joseph Penwell
21 with the Finance Section of EPA.

22 83. Respondents agree to limit any disputes concerning costs
23 to accounting errors and the inclusion of costs outside the scope
24 of this Order or not authorized by statute. Respondents shall
25 identify any contested costs and the basis of its objection in
26 writing. All undisputed costs shall be remitted by Respondents in
27 accordance with the schedule set forth above. Disputed costs shall

1 be paid into an escrow account by Respondents while any such
2 dispute is pending. Respondents bear the burden of establishing an
3 EPA accounting error or the inclusion of any cost outside the scope
4 of this Order or not authorized by statute. Interest shall accrue
5 during any cost dispute.

6 XXI. RESERVATIONS OF RIGHTS AND REIMBURSEMENT OF OTHER COSTS

7 84. EPA reserves the right to bring an action against
8 Respondents under Section 107 of CERCLA, 42 U.S.C. § 9607, for
9 recovery of all response costs incurred by the United States which
10 are not reimbursed by Respondents, including past costs, any costs
11 incurred in the event that EPA performs the PRD or any part
12 thereof, and any future costs incurred by the United States in
13 connection with response activities under CERCLA at the Site.

14 85. EPA reserves the right to bring an action against
15 Respondents to enforce any provision or requirement of this Order
16 or any requirement developed pursuant to this Order, to enforce the
17 cost reimbursement requirements of this Order, and to collect
18 stipulated penalties assessed pursuant to Section XVIII of this
19 Order or to seek penalties pursuant to Section 109 of CERCLA, 42
20 U.S.C. § 9609.

21 86. Except as expressly provided in this Order, each party
22 reserves all rights, claims, privileges, and defenses it may have.
23 Nothing in this Order shall affect EPA's response, enforcement or
24 other statutory and/or regulatory authority, including the right to
25 perform response activities or to seek injunctive relief,
26 stipulated penalties, statutory penalties, and/or punitive damages.

27 87. Following satisfaction of the requirements of this Order,

1 Respondents shall have resolved their liability to EPA for the
2 work performed by Respondents pursuant to this Order. Respondents
3 are not released from any liability, if any, for any past response
4 costs or response actions taken beyond the scope of this Order
5 regarding removals, other operable units, remedial design and
6 remedial action of the Hylebos Waterway, or any activities pursuant
7 to Section 121(c) of CERCLA, 42 U.S.C. § 9621(c).

8 XXII. DISCLAIMER

9 88. By signing this Order and taking actions under this
10 Order, the Respondents neither admit nor deny EPA's Findings of
11 Fact and Conclusions of Law. Furthermore, the participation of the
12 Respondents in this Order shall not be considered an admission of
13 liability and is not admissible as evidence against them in any
14 judicial or administrative proceeding other than a proceeding by
15 EPA or the United States to enforce this Order or any judgment
16 relating to it. Respondents retain their rights to assert claims
17 against each other and other potentially responsible parties at the
18 Site. However, the Respondents agree not to contest the validity
19 or terms of this Order, or the procedures underlying or relating to
20 it in any action brought by the United States, including EPA, to
21 enforce its terms.

22 XXIII. OTHER CLAIMS

23 89. In entering into this Order, Respondents waive any right
24 to seek reimbursement under Section 106(b) of CERCLA, 42 U.S.C. §
25 9606(b) for work covered by this Order. Respondents also waive any
26 right to present a claim under Sections 111 or 112 of CERCLA, 42
27 U.S.C. §§ 9611, 9612 for work covered by this Order. Respondents
28 HYLEBOS ADMINISTRATIVE ORDER ON CONSENT - Page 48

1 further waive all other statutory and common law claims against
2 EPA, including, but not limited to, contribution and counterclaims,
3 relating to or arising out of conduct of the PRD. This Order does
4 not constitute any decision on preauthorization of funds under
5 Section 111(a)(2) of CERCLA, 42 U.S.C. § 9611(a)(2).

6 90. Nothing in this Order shall constitute or be construed as
7 a covenant not to sue or release from any claim, cause of action or
8 demand in law or equity against any person, firm, partnership,
9 subsidiary or corporation not a signatory to this Order, including
10 agencies of the United States other than EPA, for any liability it
11 may have arising out of or relating in any way to the generation,
12 storage, treatment, handling, transportation, release, or disposal
13 of any hazardous substances, pollutants, or contaminants at, from,
14 or taken to the Site.

15 91. Respondents shall not seek to recover any costs or
16 attorneys fees from EPA with regard to any matter connected with
17 implementation of this Order.

18 XXIV. FINANCIAL ASSURANCE, INSURANCE, AND INDEMNIFICATION

19 92. Respondents (collectively or individually) shall
20 establish and maintain financial security for performance of the
21 work and any other obligations required under this Order, including
22 a margin for cost overruns. Within thirty (30) days after the
23 approval of the PRD Work Plan by EPA, one or more Respondents shall
24 demonstrate:

25 (a) A current rating for its most recent bond issuance
26 of no lower than BBB, as issued by Standard and Poor's, or Baa, as
27 issued by Moody's; and

1 (b) Equity of at least six (6) times the amount of the
2 performance of the Work that remains to be completed.

3 93. To demonstrate the financial assurance for performance
4 of the work pursuant to Paragraph 92 of this Order, Respondents
5 shall submit to EPA a copy of an independent certified public
6 accountant's report on examination of Respondents' most recent
7 completed fiscal year. Respondents shall resubmit the information
8 required by Paragraph 92 annually, on the anniversary of the
9 effective date of this Order. In the event that EPA determines at
10 any time that the financial assurances provided pursuant to this
11 Section are inadequate, Respondents shall, within thirty (30) days
12 of receipt of notice of EPA's determination, obtain and present to
13 EPA for approval one of the other forms of financial assurance
14 listed in 40 CFR § 264.143. Respondents' inability to demonstrate
15 financial ability to complete the work shall not excuse performance
16 of any activities required under this Order.

17 94. (a) Prior to commencement of any work under this Order,
18 Respondents (collectively or individually) shall secure, and shall
19 maintain in force for the duration of this Order, and for two (2)
20 years after the completion of all activities required by this
21 Order, Comprehensive General Liability ("CGL") and automobile
22 insurance, naming as an additional insured the United States. The
23 CGL insurance shall include Contractual Liability Insurance in the
24 amount of \$ 1 million per occurrence, and Umbrella Liability in the
25 amount of \$2 million per occurrence.

26 (b) For the duration of this Order, Respondents shall
27 satisfy, or shall ensure that their contractors or subcontractors

1 satisfy, all applicable laws and regulations regarding the
2 provision of employer's liability insurance and workmen's
3 compensation insurance for all persons performing work on behalf of
4 the Respondents, in furtherance of this Order.

5 (c) If Respondents demonstrate by evidence
6 satisfactory to EPA that any contractor or subcontractor maintains
7 insurance equivalent to that described above, or with respect to
8 that contractor or subcontractor Respondents need provide only that
9 portion of the insurance described above which is not maintained by
10 the contractor or subcontractor.

11 (d) Prior to commencement of any work under this
12 Order, and annually thereafter on the anniversary of the effective
13 date of this Order, Respondents shall provide to EPA certificates
14 or declarations of such insurance.

15 95. At least seven (7) days prior to commencing any work
16 under this Order, Respondents shall certify to EPA that the
17 required insurance has been obtained by that contractor.

18 96. The Respondents agree to indemnify and hold the United
19 States Government, its agencies, departments, agents, and employees
20 harmless from any and all claims or causes of action arising from
21 or on account of acts or omissions of Respondents, its employees,
22 agents, servants, receivers, successors, or assignees, or any
23 persons including, but not limited to, firms, corporations,
24 subsidiaries and contractors, in carrying out activities under this
25 Order. The United States Government or any agency or authorized
26 representative thereof shall not be held as a party to any contract
27 entered into by Respondents in carrying out activities under this

1 Order.

2 XXV. EFFECTIVE DATE AND SUBSEQUENT AMENDMENT

3 97. The effective date of this Order shall be the date it is
4 signed by EPA. Except when expressly stated otherwise herein, all
5 time periods referred to in this Order shall be construed as
6 calendar days, rather than business or working days. Any time
7 period scheduled to begin on the occurrence of an act or event
8 shall begin on the day after the act or event. If the final day of
9 any time period falls on a Saturday, Sunday, or legal holiday, the
10 time period shall be extended to the next regular business day.

11 98. In addition to the procedures set forth elsewhere in this
12 Order, this Order may be amended by agreement between EPA and
13 Respondents. Amendments shall be in writing and shall be effective
14 when signed by EPA. EPA Project Coordinators do not have the
15 authority to sign any amendment to this Order.

16 99. No informal advice, guidance, suggestions, or comments by
17 EPA regarding reports, plans, specifications, schedules, or any
18 other writing submitted by Respondents will be construed as
19 relieving Respondents of their obligation to obtain such formal
20 approval as may be required by this Order. Any deliverables,
21 plans, technical memoranda, reports (other than monthly progress
22 reports) specifications, schedules and attachments required by this
23 Order or developed pursuant to this Order, are, upon approval by
24 EPA, incorporated in, and made an enforceable part of, this Order
25 by this reference.

26 XXVI. TERMINATION AND SATISFACTION

27 100. This Order shall terminate when either: (1) Respondents
28 HYLEBOS ADMINISTRATIVE ORDER ON CONSENT - Page 52

1 demonstrate in writing and certify to the satisfaction of EPA that
2 all activities required by this Order, including any additional
3 work, payment of all costs, and any stipulated penalties demanded
4 by EPA, have been performed, and EPA has approved the certification
5 set forth in Paragraph 101 below; or (2) the obligation for any
6 remaining work required by this Order is assumed under a different
7 agreement with EPA that is in full force and effect. Respondents'
8 obligation to comply with Sections XVI (Record Preservation),
9 XX (Reimbursement of Response and Oversight Costs); and XXI
10 (Reservations of Rights and Reimbursement of Other Costs), of this
11 Order shall remain in full force and effect without time or other
12 limitation.

13 101. The following certification shall be signed by a
14 responsible official on behalf of Respondents:

15 In accordance with 28 U.S.C. § 1746, I certify under
16 penalty of perjury under the laws of the United
17 States that the information contained in and
18 accompanying this certification is true, accurate,
19 and complete. Dated this __ day of ____, 199__.

20 For purposes of this Order, a responsible official is a corporate
21 official in charge of a principal business function.

22 IT IS SO ORDERED, this 29th day of November, 1993.

23 UNITED STATES ENVIRONMENTAL
24 PROTECTION AGENCY

25 By: 

26 Carol A. Rushin, Chief
27 Superfund Branch
28 EPA Region 10

1 RESPONDENTS hereby consent to the issuance of this ORDER, and agree
2 to abide by each and every provision herein, and to perform each
3 and every task or requirement herein.

4 *Hbs*
5 BY: *Frank W. Wierf* DATE: *10/29/93*
6 (NAME)
7 Title: *Vice-President - Remediation*
8 *Elf Atochem North America, Inc.*

9 BY: _____ DATE: _____
10 Title: _____

11 BY: _____ DATE: _____
12 Title: _____

13 BY: _____ DATE: _____
14 Title: _____

15 BY: _____ DATE: _____
16 Title: _____

17 BY: _____ DATE: _____
18 Title: _____

1 RESPONDENTS hereby consent to the issuance of this ORDER, and agree
2 to abide by each and every provision herein, and to perform each
and every task or requirement herein.

3 OCCIDENTAL CHEMICAL CORPORATION

4 BY: *Michael J. Rudick* DATE: 11/2/93
5 (NAME) Michael J. Rudick
6 Title: Vice President and General Counsel

7
8 BY: _____ DATE: _____
9 Title: _____

10
11 BY: _____ DATE: _____
12 Title _____

13
14 BY: _____ DATE: _____
15 Title: _____

16
17 BY: _____ DATE: _____
18 Title: _____

19
20 BY: _____ DATE: _____
21 Title _____

1 RESPONDENTS hereby consent to the issuance of this ORDER, and agree
2 to abide by each and every provision herein, and to perform each
3 and every task or requirement herein.

4 BY: _____ DATE: _____
5 (NAME)
6 Title:

7
8 BY: _____ DATE: _____
9 Title:

10
11 BY: _____ DATE: _____
12 Title

13
14 BY: _____ DATE: _____
15 Title:

16
17 BY: _____ DATE: _____
18 Title:

19
20 BY: Ralph M. [Signature] DATE: 11-19-93
21 Title President
22 General Metals of Tacoma, Inc.

1 RESPONDENTS hereby consent to the issuance of this ORDER,
2 and agree to abide by each and every provision herein, and
3 to perform each and every task or requirement herein.

4 BY: John Tugito DATE: 11/22/93
5 (NAME)
6 Title: EXECUTIVE DIRECTOR
7 PORT OF TACOMA

8 BY: _____ DATE: _____
9 (NAME)
10 Title: _____

11 BY: _____ DATE: _____
12 (NAME)
13 Title: _____

14 BY: _____ DATE: _____
15 (NAME)
16 Title: _____

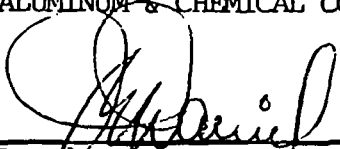
17 BY: _____ DATE: _____
18 (NAME)
19 Title: _____

20 BY: _____ DATE: _____
21 (NAME)
22 Title: _____

1 RESPONDENTS hereby consent to the issuance of this ORDER,
2 and agree to abide by each and every provision herein, and
3 to perform each and every task or requirement herein. Such
4 consent is conditional on this Order being signed by each
5 member of the Hylebos Cleanup Committee and each member of
6 the Hylebos Cleanup Committee approving the Amended Hylebos
7 Cleanup Committee Participation Agreement to be voted on at
8 the November 4, 1993 meeting of the Committee.

KAISER ALUMINUM & CHEMICAL CORPORATION

BY:


(Name) J. E. Dahiel
Title: Vice President &
General Manager

DATE:

11/2/93

BY:

(Name)
Title:

DATE:

BY:

(Name)
Title:

DATE:

BY:

(Name)
Title:

DATE:

BY:

(Name)
Title:

DATE:

BY:

(Name)
Title:

DATE:

1 RESPONDENTS hereby consent to the issuance of this ORDER, and agree
2 to abide by each and every provision herein, and to perform each
3 and every task or requirement herein. Such consent is conditional on this Order
4 being signed by each member of the Hylebos Cleanup Committee and each member of the
5 Hylebos Cleanup Committee approving the Amended Hylebos Cleanup Committee Participation
6 Agreement to be voted on at the November 4, 1993 meeting of the Committee.

ASARCO Incorporated

BY: Augustus Kinsolving DATE: 11/3/93

(NAME) Augustus Kinsolving

Title: Vice President, General Counsel & Secretary

BY: _____ DATE: _____

Title:

BY: _____ DATE: _____

Title

BY: _____ DATE: _____

Title:

BY: _____ DATE: _____

Title:

BY: _____ DATE: _____

Title

October 21, 1993
Hylebos Waterway PRD SOW

APPENDIX I

**STATEMENT OF WORK
HYLEBOS WATERWAY**

RECEIVED

JUN 12 1995

SUPERFUND BRANCH

Table of Contents
Appendix I

<u>Section</u>	<u>Page</u>
I. INTRODUCTION	1
A. Purpose	1
B. Description of the Selected Remedy	1
1. Key Elements of the CB/NT Record of Decision	1
a. Source Control	1
b. Sediment Remedial Action	2
c. Natural Recovery	2
d. Site Use Restrictions	3
e. Monitoring	3
2. Cleanup Objectives	3
3. Applicable, or Relevant and Appropriate, Requirements, and To Be Considered Criteria	4
a. Clean Water Act Section 401	4
b. Clean Water Act Section 404	5
c. Rivers and Harbors Act	5
d. Other ARARs	6
e. TBCs	7
4. Implementation of the Remedy	9
a. General Background	9
b. Remedial Design Process	10
c. Pre-Remedial Design Approach	10
II. WORK TO BE PERFORMED BY RESPONDENTS	14
A. Remedial Design Planning and Management	14
1. Description	14
2. Deliverables	14
a. RD Work Plan	14
b. Progress Reports	15
B. Pre-Remedial Design Activities	16
1. Description	16
a. Compilation of Existing Data	16
b. Round 1 Sampling and Analysis	17
c. Evaluation of Data and Remedial Action Alternatives	20
d. Round 2 Sampling and Analysis	21
e. Additional Studies	23

2.	Deliverables	24
a.	Summary of Existing Information	24
b.	Pre-Remedial Design Sampling and Analysis Plan	24
c.	Pre-Remedial Design Quality Assurance Project Plan	25
d.	Pre-Remedial Design Health and Safety Plan	25
e.	Identification of Disposal Sites	26
f.	Pre-Remedial Design Data Report	26
g.	Evaluation of Data, Screening of Remedial Action Alternatives, and Recommendation of a Remedial Action Plan	27
h.	Round 2 Sampling and Analysis Deliverables	29
i.	Additional Studies and Deliverables	29
III.	SCHEDULE FOR SUBMISSION OF MAJOR DELIVERABLES	29
IV.	BIBLIOGRAPHY	39

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1	Schedule for Submission of Major Deliverables	31
1A	Level of Effort Assumptions for Round 1 Schedule	32
2	Sediment Quality Objectives	33
3	Target Analytes for Sediment Remedial Design	35
4	Chemical Decision Criteria to be used in Pre-Remedial Design and Remedial Design	36
5	Biological Decision Criteria to be used in Pre-Remedial Design and Remedial Design	38

LIST OF ACRONYMS

AET	Apparent Effects Threshold
AKART	All Known Available and Reasonable Methods of Treatment
AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
CAD	Confined Aquatic Disposal
CAAP	Confinement Alternative Assessment Procedure
CB/NT	Commencement Bay Nearshore/Tideflats
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
COE	U.S. Army Corps of Engineers
CWA	Clean Water Act
Ecology	Washington Department of Ecology
EPA	U.S. Environmental Protection Agency
HSP	Health and Safety Plan
ML	Maximum Level
NCP	National Contingency Plan
NPDES	National Pollutant Discharge Elimination System
OSHA	Occupational Safety and Health Administration
PSDDA	Puget Sound Dredged Disposal Analysis
PSEP	Puget Sound Estuary Program
PSWQA	Puget Sound Water Quality Authority
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
RI/FS	Remedial Investigation and Feasibility Study
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SL	Screening Level
SOW	Statement of Work
SQO	Sediment Quality Objective
SRAL	Sediment Remedial Action Level
TBC	To be Considered
WAC	Washington Administrative Code
WSHA	Washington Safety and Health Administration
USC	United States Code

**STATEMENT OF WORK FOR PRE-REMEDIAL DESIGN
FOR THE COMMENCEMENT BAY NEARSHORE/TIDEFLATS
SUPERFUND SITE — HYLEBOS WATERWAY PROBLEM AREAS**

PIERCE COUNTY, WASHINGTON

I. INTRODUCTION

A. PURPOSE

The purpose of this Statement of Work (SOW) for the Hylebos Waterway problem areas of the Commencement Bay Nearshore/Tideflats (CB/NT) Superfund site is to partially implement the Record of Decision (ROD) that was signed by the Regional Administrator of the U.S. Environmental Protection Agency (EPA) on September 29, 1989 and to fully implement the Administrative Order on Consent (AOC) entered into by EPA and the Respondents, to which this SOW is Appendix I. The EPA *Superfund Remedial Design and Remedial Action Guidance* (OSWER Directive 9355.0-4A), the CB/NT ROD, the approved pre-remedial design work plan, any additional relevant guidance shall be followed in implementing this SOW.

B. DESCRIPTION OF THE SELECTED REMEDY

1. Key Elements of the CB/NT Record of Decision

The CB/NT ROD specifies the selected remedy for Operable Unit 01 (sediments) and Operable Unit 05 (sources) for the CB/NT site. The remedy consists of five elements: source control, sediment remedial action, natural recovery, site use restrictions, and monitoring, which are to be implemented in eight CB/NT problem areas, including two problem areas in the Hylebos Waterway. Each of these elements is described below.

a. Source Control - Source control activities are implemented by the Washington Department of Ecology (Ecology) and other regulatory agencies on a property-specific basis within each problem area. Source control activities include source identification, permitting of discharges or sources (existing permits, modified permits, and new permits), implementation of best management practices, and cleanup and abatement. Ecology also will achieve source control by using agreed orders and consent decrees.

Ecology will implement EPA's *Source Control Strategy* (May, 1992) and will evaluate the success of source control based on pre-remedial design data, environmental compliance information, and sediment trap data. Source control activities are not part of this SOW, however an assessment of the potential for sediment recontamination from existing sources after completion of the remedial action is a part of remedial design and this SOW.

b. Sediment Remedial Action - The ROD specifies confinement as a component of the remedy for contaminated sediments and requires the further refinement and evaluation of four sediment confinement options: in-place capping, confined aquatic disposal, nearshore disposal, and upland disposal. In-place capping involves containment and isolation of contaminated sediments by placing clean material on top of existing substrate. Confined aquatic disposal involves dredging contaminated sediments followed by subtidal aquatic disposal and capping with clean material. Nearshore disposal involves dredging contaminated sediments followed by confined disposal in the nearshore environment. Upland disposal involves dredging contaminated sediment and transporting the sediment to a confinement facility located in an area that is not influenced by tides. Evaluation of these four confinement options will be completed as part of the pre-remedial design process. Sediment sampling during pre-remedial design will supplement existing data and be used to refine estimates of the areal extent and volume of contaminated sediments, to assess potential water quality impacts from implementation of the confinement options, to provide a baseline assessment for subsequent monitoring, and to evaluate the potential for sediment recontamination from existing sources after completion of the remedial action, if appropriate. The scope and focus of biological resource mitigation and enhancement will also be defined during pre-remedial design.

c. Natural Recovery - Natural recovery of contaminated sediments is the process whereby the magnitude and extent of sediment contamination in the upper sediment layers is reduced over a period of time by biological, chemical, and physical processes following significant reduction or elimination of contaminant sources that adversely affect sediment quality. Reductions in surficial sediment contamination are expected to result in corresponding reductions in environmental and public health risks. Certain marginally contaminated areas of the CB/NT site are predicted to recover naturally within a 10-year period after source control measures are implemented based on modeling results and empirical data. Pre-remedial design will include an estimate of recovery rates for areas which Respondents propose for natural recovery. Monitoring to confirm the long-term effectiveness of the predicted natural recovery is part of the overall CB/NT selected remedy. If monitoring data indicate that natural recovery is not likely in the 10 years following source control, the need for active sediment remediation will be reassessed.

d. Site Use Restrictions - Site use restrictions consist mainly of public health advisories and educational programs intended to reduce potential exposure to site contamination, particularly through ingestion of contaminated seafood.

e. Monitoring - Source monitoring and sediment remedial design sampling play a key role in the selection and timing of remedial action. Typically, source monitoring will be undertaken by programs directed by Ecology. Sediment sampling during pre-remedial design will be directed by EPA and used to estimate volumes of sediment requiring remediation, to determine sediment characteristics for the evaluation of disposal options, and to assess the potential for natural recovery in the problem areas. Sediment sampling may also be conducted near sources during pre-remedial design to evaluate the potential for sediment recontamination from existing sources after completion of the remedial action and to better define the remedial alternative. The ROD also requires long-term monitoring within problem areas, at disposal sites, and at habitat mitigation and restoration areas (if required under the selected remedy) to evaluate the effectiveness of the remedy in achieving the sediment quality objectives and in improving habitat function for fisheries and other natural resources.

2. Cleanup Objectives

The CB/NT ROD defines the following cleanup terms:

- **Sediment Quality Goal:** The sediment quality goal for the CB/NT site is a conceptual target condition for Puget Sound, which is defined by Element P-2 of the 1989 Puget Sound Water Quality Authority plan (the PSWQA Plan, PSWQA 1988) as the absence of acute or chronic adverse effects on biological resources or significant human health risk. The PSWQA Plan required Ecology to develop numerical standards to facilitate achievement of the sediment quality goal under Element P-2. Subsequent to issuance of the CB/NT ROD, these standards are codified in Chapter 173-204 of the Washington Administrative Code (WAC).
- **Sediment Quality Objective:** The sediment quality objectives (SQOs) are discrete and measurable targets for project cleanup related to the sediment quality goals. The objectives are measurable in terms of specific human health risk assessments, environmental effects tests, and associated interpretation guidelines. The resulting effects-based biological test results and chemical concentrations are scientifically acceptable definitions of the sediment quality goal using available information. Sediment quality objectives are performance standards for the CB/NT site. Sediment quality objectives for individual chemical contaminants that were developed in the RI/FS and that are specified in the ROD are provided in Table 2.

- **Sediment Remedial Action Level:** The sediment remedial action level (SRAL) for a chemical is the maximum concentration of that chemical that will be reduced to the SQO within a 10 year natural recovery period, following source control. SRALs are defined in the ROD to distinguish areas that exceed the sediment quality objectives (but are predicted to recover naturally) from areas that are more contaminated and require active remediation to achieve the sediment quality objectives. The primary intent of active remediation of sediments is to achieve a net environmental and public health benefit; therefore, consideration of habitat restoration issues is also required.

EPA, in consultation with Ecology, is considering whether information received by EPA since issuance of the ROD, such as the promulgation of the Washington State Sediment Management Standards, or the submission by Respondents of new health risk information on a particular chemical, supports the need to change the selected remedy either by issuance of an Explanation of Significant Differences (ESD), or by amendment of the ROD, pursuant to 40 CFR §300.825. If EPA issues an ESD or amends the ROD, the new standards in that ROD will be incorporated into the AOC and SOW, and into the pre-remedial design work performed under the AOC.

3. Applicable, or Relevant and Appropriate, Requirements, and To Be Considered Criteria

Pre-remedial design sampling and analysis, evaluations conducted under this SOW, and remedial design plans and specifications must provide sufficient data to ensure that requirements of several different regulatory programs are met. The requirements of these programs are described below.

a. **CWA Section 401** - Section 401 of the Clean Water Act (CWA) requires that both dredging and dredged material disposal operations shall not violate applicable effluent standards or water quality standards. EPA, working with Ecology, will be responsible for certifying that such operations will comply with this requirement. The data necessary to make such a determination include physical and chemical data on the sediments potentially subject to dredging, and physical and chemical data on the receiving water bodies at both the dredging site and the disposal site. This determination may allow for the designation of mixing zones within which standards may be exceeded, but beyond which all applicable standards must be met. While dredging operations conducted as part of a remedial action within a CB/NT problem area do not require following the procedures for a formal Section 401 water quality certification, the dredging operations must comply with the substantive requirements of such certification.

b. CWA Section 404 and 404(b)(1) Guidelines (40 CFR Part 230) -

Section 404 of the CWA regulates the discharge of dredged or fill material into waters of the United States. Section 404(b)(1) of the CWA instructs EPA to promulgate guidelines for evaluating proposed projects involving such discharges, which are called the "404(b)(1) Guidelines", 40 CFR Part 230. Under the Section 404(b)(1) Guidelines, discharges of dredged or fill material may be permitted if there is no practicable alternative to the proposed discharge that would have a less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. The term "practicable" is defined in CWA regulations as "available and capable of being done after taking into consideration cost, existing technology, and logistics, in light of overall project purposes". Section 404(b)(1) Guidelines require demonstration that the proposed discharge of dredged or fill material will not:

- Cause or contribute, after consideration of disposal site dilution and dispersion, to violations of any applicable state water quality standard
- Violate any applicable toxic effluent standard or prohibition under Section 307 of the CWA
- Jeopardize the continued existence of any endangered or threatened species or contribute to the destruction or modification of any critical habitat for such species
- Contribute to significant degradation of the waters of the United States

The proposed discharge of dredged or fill material must avoid to the fullest extent practicable adverse effects on human health, aquatic ecosystems, and recreational, aesthetic, and economic values. Section 404 also maintains that degradation or destruction of special aquatic sites such as wetlands represents an irreversible loss of valuable aquatic resources that should be avoided. Unavoidable impacts must be minimized. Impacts which cannot be minimized must be compensated for by the provision of an alternate resource. Dredged material disposal conducted as part of a remedial action within a CB/NT problem area must comply with the substantive requirements of the 404(b)(1) Guidelines. Therefore, sufficient information must be collected so that EPA can determine whether the proposed remedial action will comply with Section 404 of the CWA.

c. Rivers and Harbors Act (33 CFR Parts 320, 322) - Prohibits

unauthorized activities that obstruct or alter a navigable waterway. In particular, Section 10 of the Act applies to any dredging and/or disposal activity in navigable waters of the United States. Authorization of such activities follows a public interest review of the proposed activity. This review is based on an evaluation of probable impacts (including cumulative

impacts), which is in turn based on a balancing of the benefits of the proposal against its reasonably foreseeable detriments. The parameters on which this decision is based are outlined in 40 CFR Part 320.4. They include effects on wetlands; fish and wildlife; historic, cultural, scenic, and recreational values; coastal zones; marine sanctuaries; other federal, state, and local requirements; navigation; environmental benefits; economics; as well as mitigation to minimize adverse project impacts.

d. Other ARARs - Other ARARs, including, but not limited to the following, may impose requirements on the remedial design requirements in addition to those established by the primary ARARs discussed above:

- **Clean Water Act (CWA), 33 United States Code (U.S.C.) §1251 *et seq.***
 - Section 304 of the CWA (33 U.S.C. §1314) requires EPA to publish Water Quality Criteria for the protection of human health and aquatic life.
 - Sections 301, 302, and 303 of the CWA (33 U.S.C. §1311, 1312, and 1313), and 40 CFR Part 131, require states to develop Water Quality Standards. Washington Water Quality Standards are promulgated under the Washington Water Pollution Control Act (Chapter 90.48 Revised Code of Washington (RCW); Chapter 173-201 WAC).
- Section 402 of the CWA (33 U.S.C. §1342) and 40 CFR Parts 122 and 125 establish the National Pollutant Discharge Elimination System (NPDES), which provides for the issuance of permits for direct discharges to navigable waters. The State of Washington has been authorized to implement this program, and they do so under Chapter 173-220 WAC. Section 402 of the CWA does not apply to discharges to navigable waters that are authorized under Section 404 of the CWA.
- **Puyallup Tribe Water Quality Program (Puyallup Tribal Council Resolution No. 151288C)** - Establishes interim tribal water quality standards by adopting Washington Water Quality Standards.
- **Safe Drinking Water Act (SDWA - 42 U.S.C. §300f *et seq.*; 40 CFR Parts 141 and 143)** - Establishes standards designed to protect human health from the potential adverse effects of drinking water contaminants. Maximum Contaminant Levels are relevant and appropriate for surface water or groundwater that is a current or potential source of drinking water.

- Puyallup Tribe of Indians Settlement Act of 1989 (PL 101-41, 103 Stat. 83) - Establishes environmental standards and requirements for fishery enhancement and protection, and provides for cultural and religious preservation for activities affecting tribal interests.
- Washington Solid Waste Management Act (Chapter 70.95 RCW) and Solid Waste Regulations (WAC 173-304) - Establishes siting requirements for solid waste disposal facilities and state minimum functional performance standards for handling of solid waste.
- Water Pollution Control Act (Chapter 90.48 RCW) - Establishes permitting requirements for point source discharges to surface waters of Washington state.
- Coastal Zone Management Act (16 USC 1451 *et seq.*); Washington Shoreline Management Act (Chapter 90.58 RCW; Chapter 173-14 WAC); City of Tacoma Shoreline Ordinance (Chapter 13.10) - The Washington Shoreline Management Act, authorized under the federal Coastal Zone Management Act, establishes requirements for substantial development occurring within waters of the State or within 200 feet of a shoreline.
- Resource Conservation and Recovery Act; (RCRA; 42 U.S.C. 6901 *et seq.*) - Regulates the handling and disposal of hazardous and nonhazardous solid waste.
- Washington Hazardous Waste Management Act (Chapter 70.105 RCW; Chapter 173-303 WAC) - State requirements for designating solid wastes to determine whether they are "dangerous waste", or "extremely hazardous waste" and for handling such waste.
- Washington Hydraulics Code (Chapter 75.20 RCW; Chapter 220-100 WAC) - Establishes requirements for performing work that would use, divert, obstruct, or change the natural flow or bed of any salt or fresh waters.
- Clean Air Act (42 U.S.C. Section 7401; 40 CFR Part 50) - Establishes ambient air quality standards for chemicals and particulates.

e. TBCs - Other advisories, criteria, or guidance to be considered (TBC) in the implementation of the remedy are listed below.

- U. S. Fish and Wildlife Mitigation Policy (46 FR 7644) - Establishes guidance for the U. S. Fish and Wildlife Service recommendations to protect and conserve fish and wildlife resources.
- Memorandum of Agreement between EPA and the COE [Mitigation under CWA §404(b)(1)] - Sets forth policy and procedures for developing mitigation for compliance under CWA §404. These guidelines for mitigation include, in order of importance, avoidance, minimization, and compensatory mitigation.
- Puget Sound Water Quality Act (Chapter 90.70.011 RCW) - Authorizes the Puget Sound Water Quality Authority to develop a comprehensive plan for water quality protection in Puget Sound.
- Washington Sediment Management Standards (WAC 173-204) - Establishes numerical limits for chemical constituents in sediments. These requirements were promulgated after the CB/NT ROD was issued.
- Sediment Cleanup Standards User's Manual (Ecology, 1991 and subsequent revisions) - Provides guidance for the implementation of Section 5, Sediment Cleanup Standards, of the Sediment Management Standards (Chapter 173-204 WAC).
- Washington Standards for Confined Disposal of Contaminated Sediments (Ecology, 1990) - Establishes the Confined Alternative Assessment Procedure (CAAP) to evaluate confinement alternatives.
- Washington Department of Fisheries Habitat Management Policy (POL-410) - Calls for no net loss of productive capacity of the habitat of food and shellfish resources, restoration of the productive capacity of habitats that have been damaged or degraded, improvement of the productive capacity of existing habitats, and the creation of new habitats.
- Executive Order 11988 (40 CFR 6 Appendix A) - Establishes requirements for actions occurring within a floodplain.
- Executive Order 11990 (40 CFR 6 Appendix A) - Establishes requirements for actions within wetlands.
- Water Resources Act (Chapter 90.54 RCW) - Establishes fundamental water resource policies for preservation of Washington state water resources

- Washington Model Toxics Control Act (Chapter 70.105D RCW) and Hazardous Waste Cleanup Regulations (WAC 173-340) - Establishes Washington state cleanup requirements for state hazardous waste sites.
- Puget Sound Air Pollution Control Agency Guidelines - Provides air pollution control guidelines for acceptable ambient levels.
- Puget Sound Dredged Disposal Analysis (PSDDA 1988) - Establishes chemical and biological criteria for dredged material disposal in Puget Sound.

4. Implementation of the Remedy

a. General Background - The ROD determined that a combination of source control, sediment confinement, natural recovery, site use restrictions, and monitoring is the most appropriate remedy for achieving the CB/NT cleanup objectives. Because natural recovery was not predicted to sufficiently reduce contaminant concentrations in all areas of the Hylebos Waterway within a 10-year period, the ROD also required sediment confinement. The ROD established the sediment quality objectives (SQOs) for a number of chemicals which are known to be toxic to marine life, and which are listed in Table 5 of the ROD and in Table 2 of this SOW. The selected remedy incorporates four options for confinement of contaminated sediments: in-place capping; confined aquatic disposal; nearshore disposal; and upland disposal. The choice of confinement option ultimately applied to a site will be made in the pre-remedial design phase, and will be influenced by the status of available remedial technologies evaluated during pre-remedial design, the availability of disposal sites, and economic and development considerations.

Source control and monitoring will continue until EPA and Ecology determine that all major sources have been controlled to the extent that sediment recontamination is not predicted to occur, or the source is in compliance with all known, available, and reasonable methods of treatment (AKART). Areas associated with NPDES-permitted facilities where recontamination will occur, even though in compliance with AKARTs, may, at Ecology's discretion, be managed by Ecology with sediment impact zones. As part of pre-remedial design, Respondents will assess the potential for sediment recontamination from existing sources after the remedy is implemented. Sediment remedial actions will then be implemented, including sediment monitoring to establish a baseline from which the 10-year natural recovery period will be evaluated, and long-term monitoring of natural recovery areas to confirm pre-remedial design predictions.

The basis of the remedial design process and the contaminated sediments cleanup evaluation and decision process are described below. Additional detail is provided in Section II.

b. Remedial Design Process - The remedial design process for the Hylebos Waterway is divided into two major categories: pre-remedial design activities and remedial design activities.

The purpose of pre-remedial design activities is to provide sufficient data, analysis, and engineering evaluations to support EPA's selection of a final remediation plan. It will include collection of sufficient information to evaluate the protectiveness and environmental effects of the remediation plan, and any necessary mitigation, and to provide reasonable assurance that the remedy will meet the requirements of all ARARs. The work involves compilation of existing data, sampling and analysis for spatial resolution of chemical concentrations, physical characterization of the waterway, assessment of sediment toxicity, natural recovery analysis, preliminary habitat assessment, assessment of contaminant mobility, evaluation of the potential for sediment recontamination once the remedy is implemented, evaluation of potential disposal sites, identification and screening of remedial action alternatives, detailed evaluation of a short list of remedial action alternatives developed through the screening process, and recommendation of a preferred remediation plan.

The purpose of remedial design activities is to provide plans and specifications required to implement the selected remedy. Remedial design activities and remedial action may be completed under a separate SOW or Consent Decree after a remediation plan is selected.

c. Pre-Remedial Design Approach - The pre-remedial design approach, including the major steps in the decision process to be used in evaluating pre-remedial design data, are set forth below.

(1) Identification of Subsurface Sampling Areas for Round 1A - Existing data will be collected and evaluated to determine the location of subsurface cores. Locations will be selected based on information regarding land use, current and historical sources, existing sediment quality, and areas of sedimentation or scour based on historical and current bathymetry maps. Cores will be located to characterize the volume and extent of subsurface contamination likely requiring active remediation. The sampling and analysis plan will present the sample locations and the basis for their selection.

(2) Round 1A Subsurface Sampling - Subsurface samples will be composited and analyzed in accordance with PSDDA guidelines. The sediment chemistry will be measured first. If chemical concentrations are between the PSDDA SL and ML (see Table 4) then the Respondents can elect, with EPA approval, to not complete PSDDA toxicity tests and accept the SL exceedence for preliminary PSDDA evaluation.

(3) Identification of Nearshore Surface Sampling Areas for

Round 1B - Surface sediment samples will be collected from intertidal areas (0' to +12' MLLW) of the waterway to identify contaminated sediments which may require remediation and contaminated sediments or anthropogenic materials that may be a source of contamination to Waterway sediments. Sample locations and depths will be selected based on a visual survey of the shoreline and on existing data (land use, historical and existing source information, existing sediment quality data, and surface grain size). Sample depths will be selected such that a representative sample is taken of nearshore materials. The visual survey will be completed on days when the lowest daylight tide is below -1' MLLW and will note observed anthropogenic materials or sediments which may be acting as sources of chemical contamination to the sediments of the waterway, and will identify like areas over which representative samples can be taken. The sampling and analysis plan will present the sample locations and the basis for their selection.

(4) Round 1B Nearshore Surface Sampling Approach - The

chemistry of the intertidal surface sediment samples will be measured first. If chemical concentrations fall between the SQO (Table 2) and the second lowest apparent effects threshold (2LAET, Table 4), then the Respondents can elect, with EPA approval, to not complete toxicity tests and accept the SQO exceedence.

(5) Identification of Subtidal Sampling Areas for Round 1C - The

Round 1A data will be evaluated in combination with existing data to establish areas and volumes of sediment that will likely be dredged as part of the remedial action. The determination will be based on subsurface sediment quality, the potential for future exposure or disturbance of subsurface sediments, current and potential future land use, and physical characteristics of the waterway which may impact the viability of dredging (e.g. piers, bulkheads, slopes, and practical size of dredge areas.)

Round 1C will include surface sampling in subtidal (below 0' MLLW) areas which may not be dredged, based on the above described determination. It will also include additional subsurface samples, to fill data gaps, if identified in analysis of Round 1A data, and to collect contaminant mobility information. Sampling necessary for natural recovery (if natural recovery is proposed by Respondents) and assessment of the potential for recontamination will be collected in Round 1C. The sampling and analysis plan will present the sample locations and the basis for their selection. Subtidal surface samples will be taken in the biologically active zone, with additional surface samples collected in the top 2 cm, if necessary for the assessment of the potential for recontamination and natural recovery.

(6) Round 1C Subtidal Sampling Approach - The chemistry of

subtidal surface sediment samples will be measured first. If chemical concentrations fall

between the SQO (Table 2) and the 2LAET (Table 4), then the Respondents can elect, with EPA approval, to not complete toxicity tests and accept the SQO exceedence based only on chemistry. The sediment quality testing to be performed for the assessment of the potential for recontamination and natural recovery will be proposed by Respondents in the Round 1C sampling plan.

(7) Identify Areas of Concern - Results of Round 1A, B, and C sampling will be analyzed to identify areas of concern and areas where no further action is needed. No further action areas will be identified based on chemical concentrations below SQOs (Table 2), or toxicity tests results below the criteria in Table 5. Other areas will be designated as areas of concern. Areas of concern will be further subdivided into discrete sediment management areas that will be considered for remedial action. The first step in the process of identifying specific management areas will be to describe the site conditions including physical environment, geologic and hydrologic characteristics, and identified contaminant sources. Site plans and cross sections presenting the site conditions will be developed. Next, the sediment quality data will be evaluated to establish the areal and vertical extent of contamination, volumes needing remedial action, concentration contours, biological effects, potential for contaminant migration, and potential for natural recovery, if proposed. Site maps and tables showing these areas and the parameters of concern will be developed. Based on that information, individual sediment management areas will be identified within the problem areas that have similar physical, chemical, toxicity, and land use characteristics. Areas proposed for natural recovery will be identified. The volume of sediment requiring remedial action within each management area will be calculated and tabulated. The potential remedial actions associated with each management area will be identified.

(8) Identify Disposal Sites - Identification of potential sediment disposal sites will begin at the time of initial sediment sampling (Round 1). The first step will be to develop an inventory of upland, nearshore, and aquatic sites in the Commencement Bay area that are individually capable of containing at least 100,000 cubic yards of sediment. Respondents may also identify potential mitigation sites. It is not necessary to list all possible sites, only those with a reasonable probability of success in meeting the needs of this project. The disposal site inventory will then be subject to screening in the Screening of Options report based on effectiveness, implementability, and cost, in order to develop a preferred list of potential disposal sites. The preferred disposal sites will be used in the screening of remedial alternatives.

(9) Screen Remedial Alternatives - A potential remedial action alternative consists of the remedial action at each sediment management area (e.g. natural recovery, capping, dredging/open-water disposal, dredging/confinement), along with the

associated confinement site(s). The screening will list, map, and briefly describe potential remedial alternatives, and will identify a limited number of those alternatives for further evaluation. The process is discussed further in Section II.B.2.g.(1).

(10) Round 2 Sampling - Round 2 sampling will address collection of additional data required for selection of the remediation plan. The number, type, and location of any additional sampling will be based on the data gaps identified during pre-remedial design. Round 2 will include collection of sufficient information to evaluate the protectiveness and environmental effects of the remediation plan, and any necessary mitigation, and to provide reasonable assurance that the remedy will meet the requirements of all ARARs. Further details of Round 2 sampling are described in Section II.B.1.d.

(11) Detailed Evaluation of Remedial Action Alternatives - The limited number of alternatives identified by the screening will be evaluated with respect to the criteria set forth in Section II.B.2.g.(2). This analysis will include development of a proposed remediation plan for the waterway. Sediment quality data gaps and information needed to better characterize the disposal site(s) and other aspects of the remedial action alternatives will be identified during the course of the evaluation, and will be addressed with the Round 2 sampling before finalizing the evaluation report.

(12) Selection of a Remediation Plan - EPA will select a proposed remediation plan to be implemented in the Hylebos Waterway based on its review of the detailed evaluation of remedial action alternatives, including Respondents' proposed remediation plan. The evaluation report and proposed remediation plan will be subject to public comment, after which EPA will make a final selection of a remediation plan.

Respondents are seeking ways to achieve an expedited, cost-effective cleanup of the Hylebos Waterway that is protective of human health and the environment, is consistent with the NCP, and complies with the ROD, as may be amended by EPA. The Port of Tacoma is considering whether to apply for a permit under Section 404 of the Clean Water Act for a development project to create a nearshore fill for a marine terminal at a location in the Blair Waterway known as "Slip One." Based on the results of Round 1A, Respondents may propose an expedited cleanup of the Hylebos Waterway that utilizes the "Slip One" site for disposal of the contaminated sediments from the Hylebos Waterway. EPA will consider integrating the proposed "Slip One" development project with the requirements of this AOC and SOW if the proposal incorporates appropriate compensatory mitigation and addresses the existing mitigation site in "Slip One." If this approach is considered feasible by EPA, after consultation with the U.S. Army Corps of Engineers and the resource agencies, and if EPA and Respondents can agree on the requirements necessary to fully evaluate and expedite the proposal, the AOC and the SOW may be modified to incorporate that agreement.

II. WORK TO BE PERFORMED BY RESPONDENTS

A. PRE-REMEDIAL DESIGN PLANNING AND MANAGEMENT

1. Description

In order to plan and manage the work, Respondents shall document project tasks and management strategies in a Pre-Remedial Design (PRD) Work Plan. This work plan shall include an overall description and schedule of the pre-remedial design activities and shall be done prior to the start of any pre-remedial design tasks. Once the pre-remedial design activities begin, the monthly progress reports shall provide updates on project activities. These reports shall continue throughout the pre-remedial design work.

2. Deliverables

a. PRD Work Plan - Respondents shall submit for EPA review and approval a draft PRD Work Plan within seventy-five (75) days of the effective date of the AOC, in accordance with Section III of this SOW, Schedule for Submission of Major Deliverables. Work to be described in the PRD Work Plan shall include all pre-remedial design activities. Respondents are responsible for presenting the planning and management activities that are necessary to meet the project objectives within the schedule allowed.

The PRD Work Plan shall specify and describe all tasks to be accomplished to complete pre-remedial design, including the evaluation of options and recommendation of a remediation plan, in accordance with the ROD, the AOC, and this SOW. Pre-remedial design activities are further described in Section II.B. of this SOW.

The PRD Work Plan shall clearly describe the overall management strategy for submitting pre-remedial design planning documents, implementing pre-remedial design activities, and reporting on pre-remedial design activities. The responsibility and authority of all organizations and key personnel involved in conducting the pre-remedial design should be outlined. Detailed descriptions of each of these deliverables are provided in the following sections.

Elements of the PRD Work Plan include, but are not limited to, the following:

- A project delivery strategy, describing the strategy for managing pre-remedial design activities and achieving timely submittal of high quality deliverables;
- A list and description of individual pre-remedial design subtasks;

- A proposed schedule, including a timeline for completion of all pre-remedial design subtasks and for submittal to EPA of interim and final deliverables, including but not limited to the deliverables enumerated in this SOW;
- The proposed composition and individual qualifications of a technical team or teams of personnel and/or contractors responsible for pre-design and design subtasks;
- A description of all standards, criteria, and regulations applicable to the design of the remedy.
- A description of the process and screening criteria and process to be used in evaluating contaminated sediment confinement options.

Upon approval by EPA, the final pre-remedial design work plan, with the schedules for performance of activities and submission of deliverables, shall be incorporated into and be enforceable under this AOC.

The PRD Work Plan and schedule may require amendment if new information is discovered which was not anticipated at the time the PRD Work Plan was developed, or if a change in the management strategy is proposed, as deemed necessary by EPA or proposed by Respondents and approved by EPA. Any amendments shall be subject to EPA comment and shall require EPA approval in writing.

b. Progress Reports - Monthly progress reports shall be submitted throughout the pre-remedial design phase, in accordance with the schedule set forth in Section XII of the AOC. At a minimum, monthly reports shall contain the following information regarding the preceding month:

- A description of the actions which have been taken to comply with the AOC and SOW during the previous month;
- An estimate of the percentage of pre-remedial design work completed to date;
- Summaries of new findings;
- Summaries of deviations from approved work plans;
- Summaries of contacts with representatives of the local community, public interest groups, press, and federal, state or tribal government;

- Summaries of problems or anticipated problems in meeting the schedule or objectives set forth in the SOW and PRD work plan;
- Summaries of solutions developed and implemented or planned to address any actual or anticipated problems or delays;
- Changes in key personnel;
- A description of work planned for the next month with schedules relating such work to the overall project schedule, including percentage of completion data;
- A list of sampling and testing reports and other data reports received by Respondents; and
- A discussion of deviations and potential future deviations from the approved schedule.

B. PRE-REMEDIAL DESIGN ACTIVITIES

1. Description

Pre-remedial design activities conducted by the Respondents will support EPA's selection of a proposed, and after public comment, final remediation plan for the Hylebos Waterway. The six key components of this task, in sequential order, are:

- a) Compilation of existing data
- b) Identification of disposal sites
- c) Round 1 sampling and analysis
- d) Evaluation of data and screening of remedial options
- e) Round 2 sampling and analysis
- f) Initial selection of a remediation plan

These key components are outlined below.

a. Compilation of Existing Data - Existing available data will be compiled to provide a preliminary assessment of the extent of contamination, current and historical sources of contamination, bathymetry of the Hylebos channel and sideslope areas, magnitude of potential impacts to biological communities and human health, and location of candidate areas for active remediation or natural recovery. This effort will focus on data needed for

pre-remedial design. The compilation of applicable historical data should include, but not be limited to, the following:

- potential sources of contamination and loading estimates
- sediment and water quality chemical data, including contaminant concentrations and conventional parameters, depths and location of samples,
- bathymetric data, including information on bank elevations and slopes,
- sediment grain size distribution, TOC
- natural resource occurrence and use
- benthic, epibenthic, and fish community structure
- toxicity testing and histopathology results
- bioaccumulation in tissues
- location of special aquatic sites (as defined in the CWA)
- occurrence of endangered or threatened species
- current patterns and velocity
- deposition/resuspension rates
- dredging records
- structure locations (e.g. piers, docks, outfalls)
- survey coordinates (e.g. sample stations, locations, piers, etc.)
- recent aerial photographs.

Additionally, information on future land use planning by the Port, City, Puyallup Tribe, and private property owners, including future dredging plans, will be requested from these entities by Respondents, and EPA, if requested. This task may require participation by Respondents in informational meetings and discussions with property owners or groups of property owners.

b. Round 1 Sampling and Analysis - The Round 1 sampling effort conducted by the Respondents will address the following objectives:

- Fill in the data gaps identified following the examination of the existing data;
- Determine the area and volume of sediment requiring remediation;
- Provide data comprehensive enough to evaluate remedial alternatives and recommend a candidate cleanup option or combination of options for each area within the waterway; and
- Minimize the amount of sampling required in Round 2.

Round 1 sampling and analysis will be adequate to resolve, at a minimum, the following issues related to remedial design:

- spatial resolution of chemical contaminant distribution
- physical characterization of the waterway
- assessment of sediment quality
- potential for natural recovery of sediments, if proposed by Respondents
- assessment of the potential for sediment recontamination from existing sources after completion of the remedial action
- preliminary assessment of sediment contaminant mobility.

Details of these elements are provided below:

Spatial Resolution of Chemical Contamination - A characterization of the vertical and horizontal distribution of chemical contamination will be performed to provide preliminary assessment of the nature and extent of sediments requiring remediation sufficient to support an evaluation of the remedial options. Such characterization shall be performed by measuring chemical concentrations in sediment at various locations and sediment horizons (including surface sediment) using grab sampling and core sampling techniques. Surface samples shall be taken at the biologically active zone or top 2 cm (if necessary for assessment of the potential for recontamination and natural recovery). Samples shall be analyzed for all analytes listed in Table 3 of this SOW unless EPA approves otherwise. EPA may require additional analytes for which information suggests there is a source, the chemical may cause potential adverse effects, and a protocol exists. Analytical techniques will be sufficiently sensitive to detect chemical concentrations at or below sediment quality objectives (SQOs) and Puget Sound Dredge Disposal Analysis (PSDDA) screening levels (SLs). Core sediments will be composited within dredging horizons for a preliminary analysis of contaminant migration under various disposal options.

This study component shall identify areas that will require remedial action. The Respondents may propose natural recovery in marginally contaminated areas that are expected to recover naturally. Respondents will accurately delineate the area and volume of sediments that will require active remediation (i.e., cleanup areas); and support an assessment of the potential for sediment recontamination from existing sources after completion of the remedial action. Improved resolution of chemical concentrations in surface sediment will also provide a baseline for subsequent monitoring efforts in areas of natural recovery.

Physical Characterization - Characterization of the physical nature of the Hylebos Waterway shall provide information necessary for preliminary evaluation of the remedial

options. The physical characterization shall include substrate type (i.e., grain size) and distribution, total organic carbon, *in situ* density/water content, outfall locations, bathymetry, and the relationship between bathymetry and engineered waterfront structures (e.g., piers, wharves, buildings, dolphins, beams, embankments, bulkheads, etc.) and data to support an engineering analysis of slope stability. The purpose of the analysis will be to assess the effects of the engineered structures and other physical features on the effectiveness, implementability, and costs of remedial options.

Assessment of Sediment Toxicity - Suites of biological effects tests may be used to delineate areas for active remediation or natural recovery, and to assess the suitability of sediments for open-water disposal when chemical data predict that biological effects might be present. Respondents may elect, with EPA approval, to perform biological tests based on the chemical criteria discussed below, or to accept the chemical criteria (PSDDA SL or SQO) as a prediction of biological effects. The suite of biological effects tests consists of three laboratory tests (two acute, one chronic) and one *in situ* chronic test for surface sediments. The acute laboratory tests will include biological effects tests using amphipods (mortality and reburial) and echinoderm embryos (mortality and abnormal development). The chronic laboratory test will use polychaete worms (mortality and growth). Benthic community alterations will be assessed by field sampling of the infauna. Toxicity tests may be performed on surface sediments when contaminant chemical concentrations are above the SQO (Table 2) but below the 2LAET (Table 4). Selected tests (e.g., amphipod, echinoderm embryo, and polychaete toxicity) may be performed on subsurface sediments if chemical concentrations are between the PSDDA SL and ML (Table 4). The subsurface bioassays will be conducted according to PSDDA program requirements on sediments composited within dredging horizons to be approved by EPA, in consultation with PSDDA agencies, for evaluation of disposal options.

Natural Recovery Considerations - If Respondents propose natural recovery for some areas of the waterway, additional analyses will be required by the EPA to determine if natural recovery is a feasible component of the selected remedial option. If natural recovery is determined to be feasible, these data will be used to recalculate the sediment remedial action levels (SRALs) that were presented in the CB/NT ROD. Additionally, modeling, analysis of surface (top 2 cm) sediment chemistry and/or benthic infauna at stations tested during the RI/FS, or at other appropriate locations, dredge horizon evaluations, or direct measures of sediment accumulation and resuspension may be used to assess the potential for sediment natural recovery. Because models currently used to evaluate natural recovery may not adequately account for the all physical and hydrologic processes affecting sediment deposition and resuspension in Commencement Bay waterways, modeling will be used to provide upper- and lower-bound estimates of recovery based on a plausible range of input parameters. The development of natural

recovery arguments shall be fully documented with actual field data or technical references.

Assessment of the Potential for Sediment Recontamination - Respondents will assess the potential for recontamination of sediments from existing sources after remediation of the Hylebos Waterway. For this assessment, Respondents will tabulate the discharge limits from existing permitted sources, review source control documents supplied or identified with some specificity by EPA (e.g. Ecology Milestone Reports, orders, permits, and inspection reports, corrective action plans, City of Tacoma stormwater data), as well as any other information known to Respondents about existing permitted and unpermitted sources of contamination. Respondents will qualitatively compare that information to the sediment data collected from sampling events 1A, B, and C, and the visual reconnaissance. Respondents shall make recommendations to EPA if the need for further investigation or control of sources is identified.

Preliminary Assessment of Contaminant Mobility - Selected sediment cores which contain contaminant concentrations high enough to require confined disposal will be subject to one or more of the following tests, in order to provide a preliminary assessment of contaminant mobility during dredging and in a confined disposal site including but not limited to: column leach tests, pore water test, standard elutriate test, modified elutriate test, and column settling test.

c. Evaluation of Data and Remedial Options - The Respondents shall evaluate the existing data and the data collected in the Round 1 sampling event in order to meet the following data evaluation objectives:

- To estimate the area and volume of sediment requiring remediation and to define those areas of moderately contaminated sediment that may be allowed to naturally recover, and those which may be permissible for open-water disposal under PSDDA;
- To reevaluate the natural recovery estimates provided in the CB/NT RI/FS and ROD, and if appropriate, develop SRALS to be used to delineate areas which are predicted to recover naturally within 10 years following source control;
- To evaluate the physical nature of the sediment (e.g., grain size and total organic carbon) and the waterway (e.g., currents and slope) and their effect on the implementability of remedial options;

- To evaluate the nature of contamination (e.g., the persistence, mobility, and degradation characteristics of the contaminants), and provide a preliminary assessment of contaminant migration under various disposal options;
- To evaluate the potential for sediment recontamination from existing sources once the remedy is implemented. Respondents shall make recommendations to EPA if the need for further investigation or source control is identified;
- To establish baseline conditions of those features that may be altered during the remedial action, such as bathymetry and sediment quality;
- To evaluate complications imposed by current and planned property use (e.g., piers, berthing areas) on any proposed remedial action; and
- To determine the data needed for remedial design.

The above data will be used by the Respondents to perform an evaluation of remedial options. This evaluation will consider the feasibility of the four sediment confinement options outlined in the ROD, with respect to the volume and types of contamination present in the Hylebos Waterway and the potential impacts the remedial options may have on existing conditions. For areas requiring active remediation, the evaluation will consider sediment disposal in a nearshore disposal site(s), confined aquatic disposal site(s), and upland disposal site(s). Capping in place may be considered in areas where a cap would be sufficiently stable, and where it would not interfere with navigation or the integrity of existing piers, or impair future development. Respondents will use the evaluation results to recommend a remediation plan for Hylebos Waterway. The recommended remediation plan may consist of a combination of the options described in the general evaluation. Respondents may also propose other options not adopted in the ROD for EPA consideration.

d. Round 2 Sampling and Analysis - The objectives of the Round 2 sampling and analysis program are to supplement the Round 1 data to provide additional information necessary to evaluate the protectiveness and environmental effects of the proposed remedial actions and disposal sites, and necessary mitigation, and to provide reasonable assurance that the remedy will meet the requirements of all ARARs. The number, type and location of additional samples will be based on data gaps identified during pre-remedial design and data needs identified during the detailed analysis of remedial options. Existing data will be used to the extent possible, but where existing data are insufficient or unavailable, field data collection will be required. Round 2 data collection will be tailored to provide information specific to the selection of the preferred remediation plan and, in general, is not intended to collect information sufficient to design the remedy. The specific Round 2

data collection requirements will be proposed by the Respondents for EPA approval.
Round 2 data collection may include the following:

- Fill in the site-specific data gaps, including delineation of the area and volume of sediments requiring remediation, that remain from Round 1 and are necessary to select the remediation plan.
- Characterize the proposed disposal site(s) and capping materials, including physical, chemical, and biological characteristics to the degree necessary for selection of the remediation plan. Physical characterization of the disposal site(s) may require depth, bathymetry, bed stability, a general assessment of the velocity of near-bottom and water column currents, capacity, and distance from the dredging site. If necessary for the selection of the remediation plan, sediment grain size and organic carbon content shall be quantified for both bed and capping materials. The biological conditions (e.g., species composition of benthic infaunal and demersal fishes) at the disposal site(s) and the potential for bioturbation shall also be characterized to the degree required for selection of the remediation plan.
- Collect data to evaluate whether the dredging and dredged material disposal operations can be designed to meet applicable effluent standards or water quality standards, as outlined in federal and state regulations and required under CWA §401. This will include an estimate of the areal extent of water quality impacts in the vicinity of the dredge and in the vicinity of the disposal activities, including effluent discharge from the disposal area.
- Collect data to evaluate whether the discharge of dredged or fill material into the aquatic ecosystem can be designed to comply with CWA §404, and to support a CWA §404(b)(1) analysis of the recommended remediation plan, including an evaluation of the environmental impact of the in-water activities, and an assessment of habitat mitigation requirements. This includes the habitat assessment discussed below.
- Conduct a preliminary assessment of the type, distribution, and estimated use of habitats in areas affected by the proposed remedial action(s), including areas within the waterway and potential disposal and mitigation sites. Remedial actions that would reduce the quality and/or quantity of intertidal or subtidal habitats will require consideration of habitat mitigation in the development of and evaluation of remedial alternatives.

- Evaluate the behavior of dredged material relevant to design of the selected confinement option, including an evaluation of potential contaminant migration pathways, including the potential for short- and long-term water quality impacts. This may include data on soil physical properties (i.e., visual classification, water content, grain size, Atterberg limits); standard and modified elutriate tests, column settling tests, and column leach tests (for nearshore sites); and column leach tests with aging (for upland sites). Respondents will collect sufficient environmental data to evaluate potential contaminant migration through the following pathways:

Surface runoff after disposal

Airborne emissions of volatile compounds or fugitive dust, if upland disposal is part of the recommended option

- Release of leachate to surface water or groundwater
- Migration through cover materials from diffusion, bioturbation, or groundwater flow.

- If the recommended remediation plan includes open-water disposal, Respondents will collect sufficient information to assess if sediments may be suitable for open water disposal under PSDDA.

Guidance on the data needs for these evaluations can be found in *Confined Disposal of Contaminated Sediments, Recommended Standards* (Parametrix, 1990a), *Effects-Based Design Process* (Parametrix 1990b) and in the *PSDDA Management Plan Report and Evaluation Procedures Technical Appendix* (PSDDA, 1989), as amended by the PSDDA annual review process.

The sequence of data collection may be important. By phasing certain data collection components, preliminary evaluations may be made that may obviate the need for further data collection or evaluations upon approval by the EPA. In considering confined disposal alternatives, for example, a preliminary evaluation of available data may suggest the use of functional designs, rather than more data-intensive, effects-based designs under the Confinement Alternative Assessment Procedure (CAAP). Round 2 data collection will occur concurrently with the preparation of the pre-remedial design evaluation report.

e. Additional Studies - At any time during pre-remedial design activities, if additional studies are deemed necessary or desirable by EPA or the Respondents to complete the pre-remedial design, Respondents shall consult with EPA, prepare planning documents

subject to EPA approval, and implement the approved plans. Respondents shall identify the need for such studies as soon as possible to avoid project delays.

2. Deliverables

a. Summary of Existing Information - Respondents shall submit to the EPA a draft summary of the compilation of existing information collected under Section II.B.1.a. above, for review and approval in accordance with the document submittal schedule set forth in Section III of this SOW. A preliminary summary of existing information necessary to develop the Round 1A sampling plan shall be submitted with the sampling plan. It will then be amended to include additional existing information needed for the PRD. Data will be summarized in a tabular format, and detailed maps will be provided, showing contaminant distribution and concentrations, bathymetric data, and structure locations. The summary shall provide adequate information to justify the sampling approach to be presented in the SAP. Data files on which summaries are based, including data validation reports, survey points, etc, shall be made available to EPA upon request.

b. Pre-Remedial Design Sampling and Analysis Plan - Respondents shall submit to the EPA a draft Sampling and Analysis Plan (SAP) for pre-remedial design sampling and analysis activities for review and approval in accordance with the document submittal schedule set forth in Section III of this SOW. The purpose of the SAP is to provide an overview of the pre-remedial design sampling program that will obtain all information needed to meet the data needs described in Section II.B.1.b. of the SOW.

The SAP shall describe the sampling objectives, the rationale for the sampling approach and plans for data use. A detailed description of sampling tasks shall then be provided, including specifications for sample identifiers; operation of major sampling equipment (e.g., vessel operation and positioning); the type, number, and location of samples to be collected; the analyses to be performed; descriptions of sampling gear and methods to be used; documentation of samples; sample containers, collection and handling; and the sampling schedule.

The SAP shall describe the data quality objectives. The SAP shall then identify and describe measures that will be taken during performance of all sampling and analysis tasks to ensure fulfillment of data quality objectives. Data quality objectives will reflect the criteria or threshold values used for remedial decisions.

In order to minimize the revisions required to the SAP for Round 1B, 1C, 2, or any additional sampling required, the pre-remedial design SAP shall address sampling and analytical methods for all sampling anticipated to be required during the course of pre-remedial design,

regardless of whether such sampling is anticipated in Round 1. Initially, sample locations and numbers will be provided only for Round 1A sampling. Subsequent amendments will provide sample locations and numbers for Round 1B, 1C, 2, and any other sampling required.

c. Pre-Remedial Design Quality Assurance Project Plan - Respondents shall submit to the EPA a draft quality assurance project plan (QAPP) for pre-remedial design sampling and analysis activities for review and approval in accordance with the document submittal schedule set forth in Section III of this SOW. The draft QAPP shall identify and describe measures that will be taken during the performance of all sampling and analysis tasks to ensure the fulfillment of data quality objectives. Data quality objectives will reflect the criteria or threshold values used for remedial decisions. The draft QAPP shall be developed in accordance with EPA guidance and the requirements of the EPA Contract Laboratory Program (CLP) and the Puget Sound Estuary Program (PSEP) and contain the following elements:

- Project Description
- Project Organization and Responsibilities
- Quality Assurance Objectives
- Sampling Procedures
- Sample Custody
- Calibration Procedures, References, and Frequency
- Analytical Procedures
- Internal Quality Control Checks
- Data Reduction, Validation, and Reporting
- Performance and System Audits
- Preventative Maintenance
- Specific Routine Procedures to Assess Data Precision, Accuracy, and Completeness
- Corrective Action
- Quality Assurance Reports to Management

In order to minimize the revisions required to the QAPP for any additional sampling required, the pre-remedial design QAPP shall address sampling and analytical methods for all sampling anticipated to be required during the course of pre-remedial design, regardless of whether such sampling is anticipated in Round 1.

d. Pre-Remedial Design Health and Safety Plan - Respondents shall submit to the EPA a draft health and safety plan (HSP) for pre-remedial design sampling and analysis activities for review and acceptance in accordance with the document submittal schedule set forth in Section III of this SOW. The draft HSP must be consistent with the requirements of CERCLA, the Occupational Safety and Health Administration (OSHA), and the Washington Safety and Health Administration (WSHA). The draft HSP shall identify

specific monitoring and management responsibilities and activities to ensure the protection of human health and to promote safety for the activities associated with pre-remedial design sampling.

e. Identification of Disposal Sites - Respondents shall submit to EPA a report on their identification of potential disposal sites for Hylebos Waterway sediments for review and approval in accordance with the document submittal schedule set forth in Section III of this SOW. The report will be based on existing data and include an inventory of upland, nearshore, and aquatic sites in the Commencement Bay area that are individually capable of containing at least 100,000 cubic yards of sediment. Respondents may also identify potential mitigation sites. It is not necessary to list all possible sites, only those with a reasonable probability of success in meeting the needs of this project. The disposal site inventory will then be subject to screening in the Screening of Remedial Options Report based on effectiveness (including ecological impacts), implementability, and cost, in order to develop a preferred list of potential disposal sites. The preferred disposal sites will be used in the screening of remedial alternatives.

f. Pre-Remedial Design Data Report - Respondents shall submit laboratory chemistry data to EPA within one week of receipt from the laboratory of the last data package from each sampling event. Respondents shall submit a technical memorandum consisting of tabulated validated data to EPA in accordance with the schedule set forth in Section III of this SOW. Respondents shall then submit to the EPA a draft report on the results of Round 1 pre-remedial design sampling and analysis activities for review and approval in accordance with the document submittal schedule set forth in Section III of this SOW. This report shall include tabulated chemical, physical, and biological data and a summary of field activities and methods. Field logs, chain-of-custody forms, and laboratory data sheets will be made available upon request by EPA. The Data Report shall include a discussion of data validation conducted in accordance with the EPA-approved QAPP. All results shall be compared to appropriate regulatory criteria or screening levels included in the ROD, the PSDDA program, and other appropriate regulatory programs. The Round 1 data report will also provide a preliminary estimate of the volume and area of sediments which may require remediation, which may be permitted for open-water disposal, and which may likely remain in place. The Round 1 Data Report shall be submitted at the conclusion of Round 1A, and shall be amended to include Round 1B and 1C data.

Respondents shall submit final chemical and biological data in an electronic format consistent with EPA's October 19, 1992 Memorandum: *Instructions for Formatting of Digital Data, Sediment (Chemical, Benthic, Bioassay), Water Column, and Shellfish Monitoring Data - Commencement Bay Nearshore/Tideflats Superfund Site*, and any subsequent revisions to that document.

g. Evaluation of Data, Screening of Remedial Action Alternatives, and Recommendation of a Remedial Action Plan - Respondents shall evaluate Round 1 data, screen remedial options and develop a recommended Remedial Action Plan for the Hylebos Waterway. Two reports will be submitted, as discussed below. The Pre-Remedial Design Evaluation Report (Evaluation Report) will incorporate the Round 1 Data Evaluation and Screening of Remedial Options Report (Screening Report), either as chapters or appendices.

(1) Round 1 Data Evaluation and Screening of Remedial Action Alternatives Report - Respondents shall submit for EPA review a Round 1 Data Evaluation and Screening of Remedial Action Alternatives Report (Screening Report), in accordance with the document submittal schedule set forth in Section III of this SOW. This report will provide an evaluation of each of the bulleted items under Section II.B.1.c. It will provide a preliminary estimate of the volume and area of sediments which will require active remediation, those which may be permitted for open-water disposal under PSDDA, and an identification of areas for which the Respondents propose natural recovery. To support the natural recovery analysis, the report will evaluate the physical processes affecting natural recovery, including sedimentation and resuspension, within Hylebos Waterway and, if appropriate, recalculate SRALs.

The report will include a preliminary evaluation of potential disposal sites and recommend a limited number of disposal sites and remedial action alternatives for further evaluation. The report will list, map, and briefly describe: 1) potential sediment management and remedial action alternatives for each sediment management area of the waterway; and 2) potential confined aquatic disposal (CAD), nearshore and upland disposal sites for sediments in the Hylebos Waterway requiring active sediment remediation. A minimum of ten alternative disposal sites (as described in Section I.B.4.d.8) or combinations of disposal sites including upland, CAD, and nearshore sites (combined with capping of selected areas, if appropriate) shall be presented to EPA. The screening will identify feasible sites or options. For example, it has been determined that capping is not a feasible alternative in the channel due to the need to maintain it for navigation, therefore, it is not necessary to list capping in the channel as an option. Respondents are encouraged to draw upon information developed for the Sitcum Waterway Remediation Project in identifying sites, but the list of potential sites shall not be limited to the sites discussed in the Sitcum Waterway Pre-Remedial Design Evaluation Report. Respondents should also recognize that the screening criteria, models, and assumptions used in the Sitcum report and in the Thea Foss report (to be developed), are not necessarily appropriate for the Hylebos project.

The evaluation of disposal sites will include a comparison of their effectiveness (including ecological impacts), implementability, and cost. EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (OSWER Directive No. 9355.0-14) and

Ecology's *Standards for Confined Disposal of Contaminated Sediments* (Parametrix, 1990) shall be used as guidance in developing screening criteria.

Based on their review and screening, Respondents shall recommend a limited number of remedial action alternatives, including disposal sites, or combinations of sites, for further evaluation. The report shall include a discussion of the rationale for the selection of these actions and sites. Each of the actions should be expected to comply with the ROD, CERCLA, and to the extent practicable, the NCP, as well as the substantive requirements of the ARARs, notably the requirements of Sections 401 and 404 of the CWA, and TBCs, such as the Washington State Confined Disposal Standards. The recommended sites shall include a minimum of one upland, one nearshore, and one CAD site, unless one of these is shown not to be a viable option, or as otherwise directed by EPA.

(2) Pre-Remedial Design Evaluation Report - Respondents shall submit for EPA review and approval a draft Pre-Remedial Design Evaluation Report (Evaluation Report), in accordance with the schedule set forth in Section III of the SOW. This report will incorporate the screening of remedial options report revised to address EPA comments. In this report, Respondents shall provide an evaluation of the limited number of remedial action alternatives, including disposal sites, or combinations of sites, retained for further consideration in the Screening Report. The analysis of remedial action alternatives shall incorporate the results of Round 2 sampling.

The evaluation of remedial action alternatives will include a narrative description and comparison of their effectiveness (including ecological impacts), implementability and cost. EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (OSWER Directive No. 9355.0-14) and Ecology's *Standards for Confined Disposal of Contaminated Sediments* (Parametrix, 1990) shall be used as guidance in performing the evaluation.

Based on this evaluation, Respondents shall recommend a comprehensive remediation plan, including disposal site(s), general plans for dredging, mitigation sites, if required, general plans for monitoring during and after remedial action, and an estimated schedule. It shall also provide:

- A demonstration that the recommended remediation plan meets the nine CERCLA evaluation criteria [NCP §300.430 (e)(9)(iii)].
- An evaluation of the ability of the recommended remediation plan to satisfy water quality standards both in the vicinity of any dredging operations and in the vicinity of the disposal site, as required under CWA §401.

- Information necessary for EPA to prepare a CWA §404(b)(1) analysis for the recommended remediation plan.
- An assessment of the potential impacts of the recommended remediation plan on existing habitat and evaluate the subsequent need for mitigation. Respondents' plans for habitat mitigation and restoration to compensate for unavoidable losses, including location(s), acreage(s), and preliminary restoration, creation, or enhancement plans for proposed mitigation site(s) if mitigation will be required by EPA, in consultation with COE, before authorizing the action under CWA §404.

Upon approval by the EPA, the Evaluation Report will be published for public review during a period for public comment. Following the public comment period, EPA will select a remediation plan.

h. Round 2 Sampling and Analysis Deliverables - Addenda to the deliverables listed above will be required to document the sampling and analysis activities performed in Round 2. Respondents shall submit to the EPA a draft SAP, QAPP, and HSP addenda, if needed, for Round 2 activities for EPA review and approval in accordance with the document submittal schedule set forth in Section III of this SOW. Upon completion of Round 2 sampling, Respondents shall submit an addendum to the data report for EPA review and approval in accordance with the schedule set forth in Section III. Results shall also be incorporated into the Pre-Remedial Design Evaluation Report.

i. Additional Studies Deliverables - Respondents shall submit draft addenda to the pre-remedial design SAP, QAPP, and HASP, if necessary, as well as any other planning documents, reports, and other deliverables associated with any additional studies necessary for pre-remedial design identified by EPA, or the Respondents, within thirty (30) days of receipt of a written request by EPA to prepare such documents, unless otherwise specified by EPA. Documents shall be subject to EPA comment and approval in accordance with the procedures set forth in Section III.

III. SCHEDULE FOR SUBMISSION OF MAJOR DELIVERABLES

The schedule for submission to EPA of deliverables described in this SOW is presented in Table 1. The level of effort assumed solely for the development of the schedule is shown in Table 1A. If, at any time during the pre-remedial design process, unanticipated conditions or changed circumstances are discovered which may result in a schedule delay, Respondents shall bring such information to the attention of EPA, pursuant to Sections IX and XIX of the AOC. EPA will determine whether a schedule extension is warranted. For each and every deliverable, report, memorandum, plan, or other item required under this SOW, if EPA dis-

approves or requires modification or revision of any deliverable, report, memorandum, plan, or other item, in whole or in part, Respondents shall submit a modified or revised version thereof to EPA that is responsive to all EPA directions, comments, or requirements within thirty (30) days after receiving such directions, comments or requirements in writing from EPA, unless a shorter or longer time is specified in this SOW or by EPA and agreed to by the parties.

Table 1—Schedule for Submission of Major Deliverables

Deliverable	Due Date ^{a,b}
Pre-Remedial Design Work Plan	75 days from AOC effective date ^{c,d}
Pre-Remedial Design SAP, QAPP, HSP (including Preliminary Summary of Existing Information)	90 days from AOC effective date ^d
Summary of Existing Information	120 days after EPA approval of Work Plan
Technical memorandum - Round 1A data	160 days after EPA approval of Pre-Remedial Design SAP and QAPP
Pre-Remedial Design Round 1A Data Report and Pre-Remedial Design SAP addendum - Round 1C sampling locations	240 days after EPA approval of Pre-Remedial Design SAP and QAPP
Pre-Remedial Design SAP addendum - Round 1B sampling locations	On or before May 15, 1994
Technical memorandum - Round 1B data	190 days after EPA approval of Round 1B SAP addendum
Round 1B addendum to Pre-Remedial Design Data Report	260 days after EPA approval of Round 1B SAP addendum
Technical memorandum - Round 1C data	190 days after EPA approval of Round 1C SAP addendum
Round 1C addendum to Pre-Remedial Design Data Report	260 days after EPA approval of Round 1C SAP addendum
Disposal Site Inventory	120 days after EPA approval of Work Plan
Round 1 Data Evaluation and Screening of Remedial Action Alternatives Report and SAP, QAPP and HSP addenda for Round 2 sampling	260 days after receipt of EPA comments on the Round 1A Data Report or 260 days after EPA approval of the Round 1C SAP addendum, whichever is later ^{e,f}
Technical memorandum - Round 2 data	160 days after EPA approval of Round 2 SAP addendum
Round 2 addendum to Pre-Remedial Design Data Report	240 days after EPA approval of Round 2 SAP addendum
Pre-Remedial Design Evaluation Report	360 days after EPA approval of Round 2 SAP and QAPP ^g

^a Schedule assumes level of effort shown on Table 1A. Schedule deadlines will be extended or shortened if the level of effort approved by EPA falls above or below the assumptions in Table 1A.

^b Days are calendar days.

^c AOC (Administrative Order on Consent) is effective upon signature by EPA.

^d If EPA disapproves the contractor selected by Respondents to develop the Work Plan, SAP, QAPP, and HSP, pursuant to paragraph 32 of the AOC, the start date for these deliverables shall be the date EPA accepts a replacement contractor.

^e The Round 2 sampling plan and Pre-Remedial Design Evaluation Report schedules are preliminary. If appropriate, they will be renegotiated when the Round 2 sampling plan is submitted to EPA.

^f If EPA has not yet determined whether or not to issue an ESD or amend the ROD, or if EPA has decided to issue an ESD or to propose amending the ROD cleanup standards as set forth in Table 2, but has not yet done so, the schedule for these deliverables will be extended in accordance with Section I.B.2 of this SOW.

Note: The following Table 1A contains preliminary estimates of the level of effort that would be commensurate with the schedule in Table 1 solely for the purposes of developing the schedule for Round 1 sampling. Although this table contains reasonable preliminary estimated based on information presented during development of this SOW, EPA has not agreed to the number of stations, the number of samples per station, or the total number of samples to the quantities reflected in this table and EPA reserves the right to require sample numbers that exceed the values in Table 1A.

Table 1A—Level of Effort Assumptions for Round 1 Schedule

Event	Sample Type	No. of Stations	Samples per Station	Total Samples
Round 1A - Subsurface	Cores	50 - 70	1 - 3	100 - 140 chemistry 50 - 75 PSDDA Bioassay suites
Round 1B - Intertidal Surface	Surface	50 - 70	1 for benthic infauna, 4 replicates per station	50 - 70 chemistry 25 - 50 stations bioassay suites and benthos to major taxa
Round 1C - Subtidal Surface	Surface	50 - 70	1 for benthic infauna, 4 replicates per station	60 - 80 chemistry 25 - 50 Bioassay suites Benthic Infauna: 15 - 20 stations to species, 25 - 50 stations to major taxa
Round 1C - Subsurface Data Gaps	Cores	15 - 30	1 - 3	30 - 60 Chemistry 15 - 30 PSDDA Bioassay suites
Round 1C - Contaminant Mobility	Cores	10	1 composite at 2 - 4 stations	3 sets contaminant mobility tests

Table 2—Sediment Quality Objectives

Chemical	Sediment Quality Objective ^a
Metals (mg/kg dry weight; ppm)	
Antimony	150 ^A
Arsenic	57 ^B
Cadmium	5.1 ^B
Copper	390 ^L
Lead	450 ^B
Mercury	0.59 ^L
Nickel	>140 ^{A,B}
Silver	6.1 ^A
Zinc	410 ^B
Organic Compounds (µg/kg dry weight; ppb)	
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAH)	5,200 ^L
Naphthalene	2,100 ^L
Acenaphthylene	1,300 ^{A,B}
Acenaphthene	500 ^L
Fluorene	540 ^L
Phenanthrene	1,500 ^L
Anthracene	960 ^L
2-Methylnaphthalene	670 ^L
High Molecular Weight PAH (HPAH)	17,000 ^L
Fluoranthene	2,500 ^L
Pyrene	3,300 ^L
Benz[a]anthracene	1,600 ^L
Chrysene	2,800 ^L
Benzofluoranthenes	3,600 ^L
Benzo[a]pyrene	1,600 ^L
Indeno[1,2,3-cd]pyrene	690 ^L
Dibenz[a,h]anthracene	230 ^L
Benzo[ghi]perylene	720 ^L
Chlorinated Organic Compounds	
1,3-Dichlorobenzene	170 ^{A,L,B}
1,4-Dichlorobenzene	110 ^B
1,2-Dichlorobenzene	50 ^{L,B}
1,2,4-Trichlorobenzene	51 ^A
Hexachlorobenzene (HCB)	22 ^B
Total Polychlorinated Biphenyls (PCBs)	150 ^A (1,000 ^B)

Table 2—Sediment Quality Objectives (Continued)

Chemical	Sediment Quality Objective ^a
Phthalates	
Dimethyl phthalate	160 ^L
Diethyl phthalate	200 ^B
Di- <i>n</i> -butyl phthalate	1,400 ^{A,L}
Butyl benzyl phthalate	900 ^{A,B}
Bis[2-ethylhexyl]phthalate	1,300 ^B
Di- <i>n</i> -octyl phthalate	6,200 ^B
Phenols	
Phenol	420 ^L
2-Methylphenol	63 ^{A,L}
4-Methylphenol	670 ^L
2,4-Dimethylphenol	29 ^L
Pentachlorophenol	360 ^A
Miscellaneous Extractable Compounds	
Benzyl alcohol	73 ^L
Benzoic acid	650 ^{L,B}
Dibenzofuran	540 ^L
Hexachlorobutadiene	11 ^B
N-nitrosodiphenylamine	28 ^B
Volatile Organic Compounds	
Tetrachloroethene	57 ^B
Ethylbenzene	10 ^B
Total xylenes	40 ^B
Pesticides	
p,p'-DDE	9 ^B
p,p'-DDD	16 ^B
p,p'-DDT	34 ^B

^a Lowest apparent effects threshold among amphipod, oyster, and benthic infauna:

- A - amphipod mortality bioassay
- L - oyster larvae abnormality bioassay
- B - benthic infauna
- - The sediment quality objective for human health has been established at 150 ppb for PCBs at the Commencement Bay Nearshore/Tideflats site, according to a method combining equilibrium partitioning and risk assessment methods.

Table 3—Target Analytes for Sediment Remedial Design^a

Conventional/Miscellaneous

Total solids
Total volatile solids
Total organic carbon
Ammonia
pH
Sulfide

Metals

* Antimony
* Arsenic
* Cadmium
Chromium^b
* Copper
* Lead
* Mercury
* Nickel
Silver
* Zinc
Tributyltin^c

Phenols and Substituted Phenols

* Phenol
* 2-Methylphenol
* 4-Methylphenol
2,4-Dimethylphenol
* Pentachlorophenol

LPAH

* Naphthalene
2-Methylnaphthalene
Acenaphthylene
Acenaphthene
Fluorene
Phenanthrene
Anthracene
* Total LPAH

HPAH

* Fluoranthene
Pyrene
Benz[a]anthracene
Chrysene
Benzo[b]fluoranthene
Benzo[k]fluoranthene
Benzo[a]pyrene
Indeno[1,2,3-cd]pyrene
Dibenz[a,h]anthracene
Benzo[ghi]perylene
* Total HPAH

Chlorinated Aromatic Compounds

* 1,3-Dichlorobenzene
* 1,4-Dichlorobenzene
* 1,2-Dichlorobenzene
* 1,2,4-Trichlorobenzene
* Hexachlorobenzene

Volatile Organic Compounds

* Tetrachloroethene
* Trichloroethene^c
* Ethylbenzene
* Total xylenes

Chlorinated Aliphatic Compounds

* Hexachlorobutadiene

Phthalate Esters

Dimethyl phthalate
Diethyl phthalate
Di-*n*-butyl phthalate
* Butylbenzylphthalate
* Bis[2-ethylhexyl]phthalate
Di-*n*-octyl phthalate

Other Organic Compounds

* Benzyl alcohol
Benzoic acid
* Dibenzofuran
Hexachloroethane^c
* N-nitrosodiphenylamine

Pesticides/PCBs

* Total PCBs
4,4'-DDE
4,4'-DDD
4,4'-DDT
Aldrin^c
Chlordane^c
Dieldrin^c
Heptachlor^c
Lindane^c

Tentatively Identified Compounds (TICs)

As determined by U.S. Environmental Protection Agency (EPA)

- * Those constituents marked with an asterisk include all constituents that were identified as problem chemicals at the Commencement Bay Nearshore/Tideflats (CB/NT) site (i.e., each of these constituents appears in at least one of Tables 3–10).
- * The target analyte list includes all constituents that have a CB/NT record of decision (ROD) sediment cleanup objective, a Washington Department of Ecology Sediment Management Standard, or a Puget Sound Dredged Disposal Analysis (PSDDA) screening level (SL) and maximum level (ML) value. CB/NT ROD sediment cleanup objectives are not available for those constituents that are marked with footnote "b" or "c."
- ^b A Washington Department of Ecology Sediment Cleanup Standard exists for chromium.
- ^c PSDDA SL and ML values exist for this constituent.

**Table 4—Chemical Decision Criteria to be used
In Pre-Remedial Design and Remedial Design**

Chemical	SQO	2LAET	PSDDA SL	PSDDA ML
Inorganics	mg/kg	mg/kg	mg/kg	mg/kg
Antimony	150	200	20	200
Arsenic	57	93	57	700
Cadmium	5.1	6.7	0.96	9.6
Chromium		270		
Copper	390	530	81	810
Lead	450	530	66	660
Mercury	0.59	2.1	0.21	2.1
Nickel	140	140	140	
Silver	6.1	6.1	1.2	6.1
Zinc	410	960	160	1,600
Nonionic Organics	ug/kg	ug/kg	ug/kg	ug/kg
LPAH	5,200	13,000	610	6,1003
Naphthalene	2,100	2,400	210	2,100
Acenaphthylene	1,300	1,300	64	640
Acenaphthene	500	730	63	630
Fluorene	540	1,000	64	640
Phenanthrene	1,500	5,400	320	3,200
Anthracene	960	4,400	130	1,300
2-methylnaphthalene	670	1,400	67	670
HPAH	17,000	69,000	1,800	51,000
Fluoranthene	2,500	24,000	630	6,300
Pyrene	3,300	16,000	430	7,300
Benz(a)anthracene	1,600	5,100	450	4,500
Chrysene	2,800	9,200	670	6,700
Benzofluoranthenes	3,600	7,800	800	8,000
Benzo(a)pyrene	1,600	3,000	680	6,800
Indeno(1,2,3-c,d)pyrene	690	1,800	69	5,200
Dibenzo(a,h)anthracene	230	540	120	1,200
Benzo(g,h,i)perylene	720	1,400	540	5,400
1,3-Dichlorobenzene	170	170	170	
1,4-Dichlorobenzene	110	120	26	260
1,2-Dichlorobenzene	50	110	19	350
1,2,4-Trichlorobenzene	51	64	13	64
Hexachlorobenzene	22	130	23	230
PCBs	150	150 ¹	130	2,500
Dimethylphthalate	160	1,400	160	
Diethylphthalate	200	1,200	97	
Di-n-butylphthalate	1,400	1,400	1,400	
Butylbenzylphthalate	900	900	470	

**Table 4—Chemical Decision Criteria to be used
In Pre-Remedial Design and Remedial Design (Continued)**

Chemical	SQO	2LAET	PSDDA SL	PSDDA ML
Di-n-octylphthalate	6,200	6,200	6,200	
Dibenzofuran	540	700	54	540
Hexachlorobutadiene	11	270	29	290
N-nitrosodiphenylamine	28	48	28	220
Ionic Organics	ug/kg	ug/kg	ug/kg	ug/kg
Phenol	420	1,200	120	1,200
2-Methylphenol	63	72	20	72
4-Methylphenol	670	1,800	120	1,200
2,4-Dimethylphenol	29	72	29	50
Pentachlorophenol	360	690	100	690
Benzyl alcohol	73	870	25	73
Benzoic Acid	650	760	400	690
Hexachloroethane			1,400	14,000
Tetrachloroethene	57	140	14	210
Trichloroethene			160	1,600
Ethylbenzene	10	37	10	50
Total xylenes	40	120	12	160
p,p-DDE	9			
p,p-DDD	16			
p,p-DDT	34	34		
Total DDT			6.9	69
Aldrin			10	
Chlordane			10	
Dieldrin			10	
Endrin				
Heptachlor			10	
Lindane			10	
Tributyltin			30	

¹ Because the cleanup level for PCBs is based on human health criteria, the SQO will substitute for the second lowest AET.

**Table 5—Biological Decision Criteria to be used
In Pre-Remedial Design and Remedial Design**

Test	Criteria to be Used for PRD Decision Making	Reference Area/Control Performance Standards	Hit Under PSDDA One Hit Rule ¹	Hit Under PSDDA Two Hit Rule ²	PSDDA Reference Area and Control Performance Standards
Amphipod	Test mean mortality > 25% and is significantly ($P < 0.05$) different from reference	Control sediment < 10% mortality; reference sediment < 25% mortality	Test mortality minus control mortality > 20% AND test mortality minus reference > 30 % AND significantly different ($P < 0.05$) from reference	Test mortality minus control mortality > 20% AND significantly different ($P < 0.05$) from reference	Control sediment < 10% mortality; reference sediment < 20% mortality above control
Bivalve larvae	Test mean combined abnormality and mortality $\geq 15\%$ mean reference response AND is significantly different ($P < 0.05$) from reference	Seawater control < 50% combined abnormality and mortality	Test response (abnormality + mortality) normalized to controls > 20% AND test minus reference > 30% AND significantly different ($P < 0.05$) from reference	Test response (abnormality + mortality) normalized to controls > 20% AND significantly different ($P < 0.05$) from reference	Seawater control < 10% abnormality AND < 50% combined abnormality and mortality; reference sediment < 20% combined abnormality and mortality normalized to control normal survivor counts
Echinoderm embryo	Same as bivalve	Same as bivalve	Same as bivalve	Same as bivalve	Same as bivalve
Neanthes growth	Mean biomass < 70% of mean reference biomass and is significantly ($P < 0.05$) different	Control sediment < 10% mortality; reference sediment biomass $\geq 80\%$ control biomass	Mean biomass < 80% or > 120% of control biomass AND mean biomass < 50% or > 150% of reference AND significantly ($P < 0.05$) different from reference	Mean biomass < 80% or > 120% of control biomass AND mean biomass < 70% or > 130% percent of reference AND significantly ($P < 0.05$) different from reference	Control sediment < 10% mortality; reference sediment biomass $\geq 80\%$ control biomass
Benthic major taxa	Mean abundance of any one group < 50% of reference and significantly ($P < 0.05$) different	Assemblage representative of unimpacted areas of Puget Sound; richness and abundance within normal range of natural variability; pollution-sensitive taxa present; pollution-tolerant taxa not numerically dominant			
Microtox			Not applied	Diminution of light (blank corrected) > 20% from T_0 and significantly ($P < 0.05$) different from reference	No numeric criteria for control sediment; reference sediment < 20% light diminution over control

1. One hit constitutes a failure for non-dispersive sites.
2. Two hits constitute a failure for non-dispersive sites.

IV. BIBLIOGRAPHY

The following list, although not comprehensive, comprises many of the regulations and guidance documents appropriate for use in pre-remedial design data gathering and in design of remedial actions:

The National Contingency Plan (revised). 40 CFR Part 300.

"Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA," U.S. EPA, October 1988, OSWER Directive No. 9355.3-01.

"Superfund Remedial Design and Remedial Action Guidance" U.S. EPA, June 1986, OSWER Directive No. 9355.0-4A.

"Source Control Strategy - Commencement Bay Nearshore/Tideflats Superfund Site," May 1992, U.S. EPA Region 10.

"Standards for Confined Disposal of Contaminated Sediments," January 1990, prepared by Parametrix for the Washington Department of Ecology.

"Evaluating Environmental Effects of Dredged Material Management Alternatives - A Technical Framework," 1992, EPA and COE, EPA 842/B-92/008.

"Synoptic Measures of Sediment Contamination, Toxicity, and Infaunal Community Composition (the Sediment Quality Triad) in San Francisco Bay," 1987. P. M. Chapman, R. N. Dexter, and E. R. Long. Mar. Ecol. Prog. Ser. 37:75-96.

"A Compendium of Superfund Field Operations Methods," Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, EPA/540/P-87/001a, August 1987, OSWER Directive No. 9355.0-14.

"Data Quality Objectives for Remedial Response Activities," U.S. EPA, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, EPA/540/G-87/003, March 1987, OSWER Directive No. 9335.0-7B.

"Guidelines and Specifications for Preparing Quality Assurance Project Plans," U.S. EPA, Office of Research and Development, Cincinnati, OH, QAMS-005/80, June 1983 revision of December 29, 1980 version.

"Users Guide to the EPA Contract Laboratory Program," U.S. EPA, Sample Management Office, August 1982, revised January 1991.

"Guidance on Applicable or Relevant and Appropriate Requirements," U.S. EPA, Office of Emergency and Remedial Response, July 9, 1987, OSWER Directive No. 9234.0-05.

"CERCLA Compliance with Other Laws Manual," Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, August 1989 (interim final), OSWER Directive No. 9234.1-01 and -02.

"Health and Safety Requirements of Employees Employed in Field Activities," U.S. EPA, Office of Emergency and Remedial Response, July 12, 1981, EPA Order no. 1440.2.

OSHA Regulations in 29 CFR 1910.120 (Federal Register 45654, December 19, 1986).

"Data Quality Objectives for Remedial Response Activities: Development Process" Volume 1, U.S. EPA Office of Emergency and Remedial Response, March 1987. OSWER Directive No. 9355.0-7B.

"Recommended Protocols for Measuring Selected Environmental Variables in Puget Sound" Puget Sound Estuary Program, March 1986, and subsequent revisions.

"Remedial Action Costing Procedures Manual" OERR, October 1987, Osver Directive No. 9355.0-10.

"Guidance on Expediting Remedial Design and Remedial Action" OERR, August 1990, Osver No. 9355.5-0222.

"PSDDA Reports. Management Plans Technical Appendix-Phase I (Central Puget Sound)." 1988. Tilley, S., D. Jamison, J. Thorton, B. Parker, J. Malek. Prepared for Puget Sound Dredged Disposal Analysis by Management Plans Work Group.

"PSDDA Reports. Evaluation Procedures Technical Appendix-Phase I (Central Puget Sound)." 1988. Phillips, K., D. Jamison, J. Malek, B. Roes, C. Krueger, J. Thorton, and J. Krull. Prepared for Puget Sound Dredge Disposal Analysis by Evaluation Procedures Work Group.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

August 1, 1996

Reply to
Attn of: ECL-116

MEMORANDUM

SUBJECT: Amendment No. 1 to the Hylebos Waterway Administrative Order on Consent;
Commencement Bay Nearshore/Tideflats Superfund site

FROM: Allison Hiltner *AH*
Office of Environmental Cleanup

TO: Addressees

Attached for your information is Amendment No. 1 to the Administrative Order on Consent (AOC) for the Hylebos Waterway problem areas of the Commencement Bay Nearshore/ Tideflats Superfund site in Tacoma, Washington. As you may recall from discussions several months ago, this Amendment reorganizes some of the deliverables in the original AOC to allow the Hylebos Cleanup Committee to perform another round of sampling without significantly impacting the overall AOC schedule.

The attached package includes the amendment to the AOC and several replacement pages to the AOC Statement of Work (SOW). Table 1 of the SOW shows the updated deliverable schedule.

Feel free to call me at (206) 553-2140 if you have any questions.

Attachment

Addressees:

Thomas Poole, COE
Bob Taylor, NOAA (for Trustee distribution)
Chris Beaverson, NOAA
John Malek, ECO-083
Russ McMillan, Ecology

RECEIVED

96 JUL 24 AM 11:19

HEARINGS CLERK
EPA--REGION 10

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10

IN THE MATTER OF:

HYLEBOS WATERWAY OF THE COMMENCEMENT
BAY NEARSHORE/TIDEFLATS SUPERFUND SITE

ASARCO INC., ELF ATOCHEM NORTH AMERICA
INC., GENERAL METALS OF TACOMA, INC.,
KAISER ALUMINUM & CHEMICAL
CORPORATION, OCCIDENTAL CHEMICAL
CORPORATION, AND THE PORT OF TACOMA

RESPONDENTS.

Proceeding Under Sections 104, 122(a),
and 122(d)(3) of the Comprehensive
Environmental Response, Compensation,
and Liability Act as amended,
42 U.S.C §§ 9604, 9622(a),
9622(d)(3)).

U.S. EPA Docket No.
1093-07-03-104/122

AMENDMENT NO. 1

ADMINISTRATIVE ORDER ON CONSENT
FOR PRE-REMEDIAL DESIGN STUDY

The undersigned hereby unanimously agree that the following listed Sections and Paragraphs of the Administrative Order on Consent for Pre-remedial Design Study (AOC), dated November 29, 1993, be substituted and replaced. Furthermore, the undersigned hereby unanimously agree that the attached revised pages of the Statement of Work (SOW), dated June 3, 1996, shall replace pages 1 through 4, and 26 through 41 of the SOW, dated October 21, 1993, which is attached as Appendix 1 and incorporated by reference into the November 29, 1993 Administrative Order on Consent for Pre-remedial Design Study.

1. Section VIII. WORK TO BE PERFORMED, Paragraph 34.e.¹

vi. On or before May 13, 1996, Respondents shall submit for EPA approval amendments to the SAP, QAPP, and HSP for Round IC, Phase 3 sampling.

vii. Within one hundred and ninety (190) days after EPA approval of the Round 1C, Phase 1 and 2 SAP Addendum, Respondents shall submit for EPA approval a Technical Memorandum providing the Round IC, Phase 1 and 2 validated data.

viii. On or before August 16, 1996, Respondents shall submit for EPA approval a Round 1C, Phase 1 and 2 Addendum to the Pre-Remedial Design Data Report that meets the requirements of Section II.B.2.f. of the SOW, as amended.

ix. Within one hundred and ninety (190) days after EPA approval of Round IC, Phase 3 SAP Addendum, Respondents shall submit for EPA approval a Technical Memorandum providing the Round IC, Phase 3 validated data.

x. Within two hundred and forty (240) days after EPA approval of the Round 1C, Phase 3 SAP Addendum, Respondents shall submit for EPA approval a Round 1C, Phase 3 Addendum to the Pre-Design Data Report that meets the requirements of Section II.B.2.f.(3) of the SOW, as amended.

2. Section VIII, WORK TO BE PERFORMED, Paragraph 34.f.

f. Round 1 Evaluation Report and Technical Memoranda

i. On or before June 28, 1996, Respondents shall submit for

¹ Section VIII., Paragraph 34.e., subsections i. through v. in the November 29, 1993 AOC are not hereby amended and remain the same.

1 EPA approval a Preliminary Evaluation of Potential Disposal Sites
2 Report that meets the requirements of Section II.B.2.g.(1). of
3 the SOW, as amended.

4 ii. On or before October 16, 1996, Respondents shall submit
5 for EPA approval a Recontamination Evaluation Report that meets
6 the requirements of Section II.B.2.g.(2). of the SOW, as amended.

7 iii. Within two hundred and forty (240) days after receipt of
8 EPA approval of the Round IC, Phase 3 SAP Addendum, Respondents
9 shall submit for EPA approval amendments to the SAP, QAPP, and
10 HSP for Round 2 Sampling required under Section.II.B.2.h. of the
11 SOW.

12 3. Section VIII. WORK TO BE PERFORMED, Paragraph 34.j.

13 j. Pre-Design Evaluation Report. Within three hundred and thirty
14 (330) days of receipt of EPA approval of the Round 2 SAP addendum
15 and QAPP, Respondents shall submit for EPA approval a Pre-Design
16 Evaluation Report containing a proposed Remediation Plan and other
17 information required under Section II.B.2.g.(4). of the SOW, as
18 amended. Upon approval by EPA, this Report, including the proposed
19 Remediation Plan, will be published for review during a period for
20 public comment.

21 Following the period of public comment, EPA may select the
22 proposed Remediation Plan that was published for comment or require
23 Respondents to modify or revise the Pre-Design Evaluation Report or
24 proposed Remediation Plan prior to EPA approval. Upon approval by
25 EPA, the Pre-Design Evaluation Report and the selected Remediation
26 Plan shall be incorporated in, and be an enforceable part of this
27 Order.

RESPONDENTS hereby agree to this amendment and consent to the issuance of this amended ORDER, and agree to abide by each and every provision herein, and to perform each and every task or requirement herein.

BY: M. E. Lamm DATE: 6/20/80
(NAME)
Title: Vice President
ASARCO Incorporated

BY: _____ DATE: _____
Title: _____

BY: _____ DATE: _____
Title: _____

BY: _____ DATE: _____
Title: _____

BY: _____ DATE: _____
Title: _____

BY: _____ DATE: _____
Title: _____

1 RESPONDENTS hereby agree to this amendment and consent to the
2 issuance of this amended ORDER, and agree to abide by each and
3 every provision herein, and to perform each and every task or
4 requirement herein.

5 BY: Jack A. Fabulich DATE: 7-16-96
6 (NAME) Jack A. Fabulich
7 Title: Acting President

8 BY: _____ DATE: _____
9 Title: _____

10 BY: _____ DATE: _____
11 Title: _____

12 BY: _____ DATE: _____
13 Title: _____

14 BY: _____ DATE: _____
15 Title: _____

16 BY: _____ DATE: _____
17 Title: _____

1 RESPONDENTS hereby agree to this amendment and consent to the
2 issuance of this amended ORDER, and agree to abide by each and
3 every provision herein, and to perform each and every task or
4 requirement herein.

5 BY: Robert Phelps DATE: 6/25/81
6 (NAME)
7 Title: President, General Metals of Tacoma, Inc.

8 BY: _____ DATE: _____
9 Title: _____

10 BY: _____ DATE: _____
11 Title: _____

12 BY: _____ DATE: _____
13 Title: _____

14 BY: _____ DATE: _____
15 Title: _____

16 BY: _____ DATE: _____
17 Title: _____

1 RESPONDENTS hereby agree to this amendment and consent to the
2 issuance of this amended ORDER, and agree to abide by each and
3 every provision herein, and to perform each and every task or
4 requirement herein.

5 BY: Robert F. Bohmeyer DATE: 6/21/96
6 (NAME)
7 Title: OF BOBLE & GATES, COUNSEL FOR
8 OCCIDENTAL CHEMICAL CORPORATION

9 BY: _____ DATE: _____
10 Title: _____

11 BY: _____ DATE: _____
12 Title: _____

13 BY: _____ DATE: _____
14 Title: _____

15 BY: _____ DATE: _____
16 Title: _____

17 BY: _____ DATE: _____
18 Title: _____

19 BY: _____ DATE: _____
20 Title: _____

1 RESPONDENTS hereby agree to this amendment and consent to the
2 issuance of this amended ORDER, and agree to abide by each and
3 every provision herein, and to perform each and every task or
4 requirement herein.

5 KAISER ALUMINUM & CHEMICAL CORPORATION

6 BY: J. E. Daniel DATE: 6/30/96

7 (NAME) J. E. Daniel

8 Title: President, Primary Products

9 BY: _____ DATE: _____

10 Title: _____

11 BY: _____ DATE: _____

12 Title: _____

13 BY: _____ DATE: _____

14 Title: _____

15 BY: _____ DATE: _____

16 Title: _____

17 BY: _____ DATE: _____

18 Title: _____

1 RESPONDENTS hereby agree to this amendment and consent to the
2 issuance of this amended ORDER, and agree to abide by each and
3 every provision herein, and to perform each and every task or
4 requirement herein.

5 BY: Jack A. Fabulich DATE: 7-16-96
6 (NAME) Jack A. Fabulich
7 Title: Acting President

8 BY: _____ DATE: _____
9 Title: _____

10
11 BY: _____ DATE: _____
12 Title: _____

13
14 BY: _____ DATE: _____
15 Title: _____

16
17
18 BY: _____ DATE: _____
19 Title: _____

20
21 BY: _____ DATE: _____
22 Title: _____

1 RESPONDENTS hereby agree to this amendment and consent to the
2 issuance of this amended ORDER, and agree to abide by each and
3 every provision herein, and to perform each and every task or
4 requirement herein.

5 BY: Robert Chap DATE: 6/23/81
6 (NAME)

7 Title: President, General Metals of Tacoma, Inc.

8 BY: _____ DATE: _____

9 Title: _____

10 BY: _____ DATE: _____

11 Title: _____

12 BY: _____ DATE: _____

13 Title: _____

14 BY: _____ DATE: _____

15 Title: _____

16 BY: _____ DATE: _____

17 Title: _____

1 RESPONDENTS hereby agree to this amendment and consent to the
2 issuance of this amended ORDER, and agree to abide by each and
3 every provision herein, and to perform each and every task or
4 requirement herein.

5 BY: *Frank B. Friedman* DATE: July 2, 1996
6 (NAME) Frank B. Friedman
7 Title: Senior Vice President
8 Health, Environment & Safety

9 BY: _____ DATE: _____
10 Title: _____

11 BY: _____ DATE: _____
12 Title: _____

13 BY: _____ DATE: _____
14 Title: _____

15 BY: _____ DATE: _____
16 Title: _____

17 BY: _____ DATE: _____
18 Title: _____

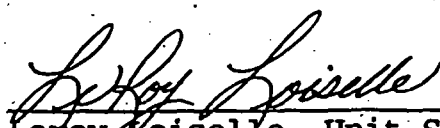
19 BY: _____ DATE: _____
20 Title: _____

21 BY: _____ DATE: _____
22 Title: _____

1 IT IS SO ORDERED, this 24th day of July, 1996.

2 UNITED STATES ENVIRONMENTAL
3 PROTECTION AGENCY

4 By:



5 Leroy Loiselle, Unit Supervisor
6 Emergency Response/Site Cleanup Unit 1
7 EPA Region 10
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27

Revised June 3, 1996
Hylebos Waterway PRD SOW

APPENDIX I

STATEMENT OF WORK HYLEBOS WATERWAY

Table of Contents
Appendix I

<u>Section</u>	<u>Page</u>
I. INTRODUCTION	1
A. Purpose	1
B. Description of the Selected Remedy	1
1. Key Elements of the CB/NT Record of Decision	1
a. Source Control	1
b. Sediment Remedial Action	2
c. Natural Recovery	2
d. Site Use Restrictions	3
e. Monitoring	3
2. Cleanup Objectives	3
3. Applicable, or Relevant and Appropriate, Requirements, and To Be Considered Criteria	4
a. Clean Water Act Section 401	4
b. Clean Water Act Section 404	5
c. Rivers and Harbors Act	5
d. Other ARARs	6
e. TBCs	7
4. Implementation of the Remedy	9
a. General Background	9
b. Remedial Design Process	10
c. Pre-Remedial Design Approach	10
II. WORK TO BE PERFORMED BY RESPONDENTS	14
A. Remedial Design Planning and Management	14
1. Description	14
2. Deliverables	14
a. RD Work Plan	14
b. Progress Reports	15
B. Pre-Remedial Design Activities	16
1. Description	16
a. Compilation of Existing Data	16
b. Round 1 Sampling and Analysis	17
c. Evaluation of Data and Remedial Action Alternatives	20
d. Round 2 Sampling and Analysis	21
e. Additional Studies	23

2.	Deliverables	24
a.	Summary of Existing Information	24
b.	Pre-Remedial Design Sampling and Analysis Plan	24
c.	Pre-Remedial Design Quality Assurance Project Plan	25
d.	Pre-Remedial Design Health and Safety Plan	25
e.	Disposal Sites Inventory	26
f.	Pre-Remedial Design Data Report	26
g.	Evaluation of Data, Screening of Remedial Action Alternatives, and Recommendation of a Remedial Action Plan	27
h.	Round 2 Sampling and Analysis Deliverables	30
i.	Additional Studies and Deliverables	30
III.	SCHEDULE FOR SUBMISSION OF MAJOR DELIVERABLES	30
IV.	BIBLIOGRAPHY	40

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1	Schedule for Submission of Major Deliverables	31
1A	Level of Effort Assumptions for Round 1 Schedule	33
2	Sediment Quality Objectives	34
3	Target Analytes for Sediment Remedial Design	36
4	Chemical Decision Criteria to be used in Pre-Remedial Design and Remedial Design	37
5	Biological Decision Criteria to be used in Pre-Remedial Design and Remedial Design	39

the Washington Safety and Health Administration (WSHA). The draft HSP shall identify specific monitoring and management responsibilities and activities to ensure the protection of human health and to promote safety for the activities associated with pre-remedial design sampling.

e. Disposal Sites Inventory - Respondents shall submit to EPA a report on their identification of potential disposal sites for Hylebos Waterway sediments for review and approval in accordance with the document submittal schedule set forth in Section III of this SOW. The report will be based on existing data and include an inventory of upland, nearshore, and aquatic sites in the Commencement Bay area that are individually capable of containing at least 100,000 cubic yards of sediment. Respondents may also identify potential mitigation sites. It is not necessary to list all possible sites, only those with a reasonable probability of success in meeting the needs of this project. The disposal site inventory will then be subject to screening in the Screening of Remedial Options Report based on effectiveness (including ecological impacts), implementability, and cost, in order to develop a preferred list of potential disposal sites. The preferred disposal sites will be used in the screening of remedial alternatives.

f. Pre-Remedial Design Data Report

(1) Respondents shall submit laboratory chemistry data to EPA within one week of receipt from the laboratory of the last data package from each sampling event.

(2) Respondents shall submit a technical memorandum consisting of tabulated validated data to EPA in accordance with the schedule set forth in Section III of this SOW.

(3) Respondents shall then submit to the EPA a draft report on the results of Round 1 pre-remedial design sampling and analysis activities for review and approval in accordance with the document submittal schedule set forth in Section III of this SOW. This report shall include tabulated chemical, physical, and biological data and a summary of field activities and methods. Field logs, chain-of-custody forms, and laboratory data sheets will be made available upon request by EPA. The Data Report shall include a discussion of data validation conducted in accordance with the EPA-approved QAPP. All results shall be compared to appropriate regulatory criteria or screening levels specified by EPA, such as are included in the ROD, the PSDDA program, and other appropriate regulatory programs. The Round 1 data report will also provide a preliminary estimate of the volume and area of sediments which may require remediation, which may be permitted for open-water disposal, and which may likely remain in place. These estimates will be revised in

subsequent amendments. The Round 1 Data Report shall be submitted at the conclusion of Round 1A, and shall be amended to include Round 1B and 1C (Phase 1, 2, and 3) data.

(4) Respondents shall submit final chemical and biological data in an electronic format consistent with EPA's October 19, 1992 Memorandum: *Instructions for Formatting of Digital Data, Sediment (Chemical, Benthic, Bioassay), Water Column, and Shellfish Monitoring Data - Commencement Bay Nearshore/Tideflats Superfund Site*, and any subsequent revisions to that document.

g. Evaluation of Data, Screening of Remedial Action Alternatives, and Recommendation of a Remedial Action Plan - Respondents shall evaluate Round 1 data, screen remedial options and develop a recommended Remedial Action Plan for the Hylebos Waterway. Three reports and three technical memoranda will be submitted, as discussed below. The Pre-Remedial Design Evaluation Report (Evaluation Report) will incorporate the Preliminary Evaluation of Disposal Sites Report, the Recontamination Evaluation Report, and the technical memoranda, either as chapters or appendices.

(1) **Preliminary Evaluation of Disposal Sites Report:** Respondents shall submit for EPA review and approval a Preliminary Evaluation of Disposal Sites Report, in accordance with the schedule set forth in Section III of this SOW. This report will include a preliminary evaluation of potential disposal sites and recommend a limited number of disposal sites for further evaluation. The report will list, map, and briefly describe potential confined aquatic disposal (CAD), nearshore and upland disposal sites for sediments in the Hylebos Waterway requiring active sediment remediation. A minimum of ten alternative disposal sites (as described in Section I.B.4.d.8) or combinations of disposal sites including upland, CAD, and nearshore sites (combined with capping of selected areas, if appropriate) shall be presented to EPA. The report will include a preliminary evaluation of results of Round 1C chemical mobility testing, and discuss the potential effects of mobility testing results on disposal site selection. Respondents are encouraged to draw upon information developed for the Sitcum Waterway Remediation Project in identifying sites, but the list of potential sites shall not be limited to the sites discussed in the Sitcum Waterway Pre-Remedial Design Evaluation Report. Respondents should also recognize that the screening criteria, models, and assumptions used in the Sitcum report and in the Thea Foss report (to be developed), are not necessarily appropriate for the Hylebos project.

The evaluation of disposal sites will include a comparison of their effectiveness (including ecological impacts), implementability, and cost. EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (OSWER Directive No. 9355.0-14) and Ecology's *Standards for Confined Disposal of Contaminated Sediments* (Parametrix, 1990) shall be used as guidance in developing screening criteria.

Based on their review and screening, Respondents shall recommend a limited number of disposal sites, or combinations of sites, for further evaluation. The report shall include a discussion of the rationale for the selection of these actions and sites. Each of the sites should be expected to comply with the ROD, CERCLA, and to the extent practicable, the NCP, as well as the substantive requirements of the ARARs, notably the requirements of Sections 401 and 404 of the CWA, and TBCs, such as the Washington State Confined Disposal Standards. The recommended sites shall include a minimum of one upland, one nearshore, and one CAD site, unless one of these is shown not to be a viable option, or as otherwise directed by EPA.

The Preliminary Evaluation of Disposal Sites Report will address disposal site issues not tied to the volume of sediments to be dredged. In EPA's sole discretion, EPA may allow Respondents to incorporate a revised report which is responsive to all EPA directions, comments, or requirements as part of subsequent reports, rather than as a separate deliverable. Respondents shall submit a revised Preliminary Evaluation of Disposal Sites report which is responsive to all EPA directions, comments, or requirements, and addresses disposal issues related to the estimated volume of sediments to be dredged in the Round 1C (Phase 3) Data Report.

(2) Recontamination Evaluation Report - Respondents shall submit for EPA review and approval a draft Recontamination Evaluation Report in accordance with the schedule set forth in Section III of this SOW. The report will assess the potential for sediment recontamination from existing sources once the remedy is implemented in accordance with Section II.B.1.b. - "Assessment of the Potential for Sediment Recontamination" of this SOW. In EPA's sole discretion, EPA may allow Respondents to incorporate a revised report which is responsive to all EPA directions, comments, or requirements as part of the Pre-Remedial Design Evaluation Report, rather than as a separate deliverable.

(3) Technical Memoranda - Respondents will submit for EPA review three technical memoranda in accordance with the schedule set forth in Section III of this SOW. These technical memoranda will provide a preliminary estimate of the volume and area of sediments which will require active remediation, those which may be permitted for open-water disposal under PSDDA, and an identification of areas for which the Respondents propose natural recovery. To support the natural recovery analysis, the report will evaluate the physical processes affecting natural recovery, including sedimentation and resuspension, within Hylebos Waterway and, if appropriate, recalculate SRALs. The report will list, map, and briefly describe potential sediment management areas and remedial action alternatives for each sediment management area of the waterway. Respondents will incorporate revised technical memoranda which are responsive to all EPA directions, comments, or requirements as part of the Pre-Remedial Design Evaluation Report, rather than as a separate deliverable.

(4) Pre-Remedial Design Evaluation Report - Respondents shall submit for EPA review and approval a draft Pre-Remedial Design Evaluation Report (Evaluation Report), in accordance with the schedule set forth in Section III of the SOW. This report will incorporate the Preliminary Evaluation of Disposal Sites Report, the Recontamination Evaluation Report, and the technical memoranda, revised to address EPA comments. This report will provide an evaluation of each of the bulleted items under Section II.B.1.c. In this report, Respondents shall provide an evaluation of the limited number of remedial action alternatives, including disposal sites, or combinations of sites, retained for further consideration in the Preliminary Evaluation of Disposal Sites Report. The analysis of remedial action alternatives shall incorporate the results of Round 2 sampling.

The evaluation of remedial action alternatives will include a narrative description and comparison of their effectiveness (including ecological impacts), implementability and cost. EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (OSWER Directive No. 9355.0-14) and Ecology's *Standards for Confined Disposal of Contaminated Sediments* (Parametrix, 1990) shall be used as guidance in performing the evaluation.

Based on this evaluation, Respondents shall recommend a comprehensive remediation plan, including disposal site(s), general plans for dredging, mitigation sites, if required, general plans for monitoring during and after remedial action, and an estimated schedule. It shall also provide:

- A demonstration that the recommended remediation plan meets the nine CERCLA evaluation criteria [NCP §300.430 (e)(9)(iii)].
- An evaluation of the ability of the recommended remediation plan to satisfy water quality standards both in the vicinity of any dredging operations and in the vicinity of the disposal site, as required under CWA §401.
- Information necessary for EPA to prepare a CWA §404(b)(1) analysis for the recommended remediation plan.
- An assessment of the potential impacts of the recommended remediation plan on existing habitat and evaluate the subsequent need for mitigation. Respondents' plans for habitat mitigation and restoration to compensate for unavoidable losses, including location(s), acreage(s), and preliminary restoration, creation, or enhancement plans for proposed mitigation site(s) if mitigation will be required by EPA, in consultation with COE, before authorizing the action under CWA §404.

Upon approval by the EPA, the Evaluation Report will be published for public review during a period for public comment. Following the public comment period, EPA will select a remediation plan.

h. Round 2 Sampling and Analysis Deliverables - Addenda to the deliverables listed above will be required to document the sampling and analysis activities performed in Round 2. Respondents shall submit to the EPA a draft SAP, QAPP, and HSP addenda, if needed, for Round 2 activities for EPA review and approval in accordance with the document submittal schedule set forth in Section III of this SOW. Upon completion of Round 2 sampling, Respondents shall submit an addendum to the data report for EPA review and approval in accordance with the schedule set forth in Section III. Results shall also be incorporated into the Pre-Remedial Design Evaluation Report.

i. Additional Studies Deliverables - Respondents shall submit draft addenda to the pre-remedial design SAP, QAPP, and HASP, if necessary, as well as any other planning documents, reports, and other deliverables associated with any additional studies necessary for pre-remedial design identified by EPA, or the Respondents, within thirty (30) days of receipt of a written request by EPA to prepare such documents, unless otherwise specified by EPA. Documents shall be subject to EPA comment and approval in accordance with the procedures set forth in Section III.

III. SCHEDULE FOR SUBMISSION OF MAJOR DELIVERABLES

The schedule for submission to EPA of deliverables described in this SOW is presented in Table 1. The level of effort assumed solely for the development of the schedule is shown in Table 1A. If, at any time during the pre-remedial design process, unanticipated conditions or changed circumstances are discovered which may result in a schedule delay, Respondents shall bring such information to the attention of EPA, pursuant to Sections IX and XIX of the AOC. EPA will determine whether a schedule extension is warranted. For each and every deliverable, report, memorandum, plan, or other item required under this SOW, if EPA disapproves or requires modification or revision of any deliverable, report, memorandum, plan, or other item, in whole or in part, Respondents shall submit a modified or revised version thereof to EPA that is responsive to all EPA directions, comments, or requirements within thirty (30) days after receiving such directions, comments or requirements in writing from EPA, unless a shorter or longer time is specified in this SOW or by EPA and agreed to by the parties.

Table 1—Schedule for Submission of Major Deliverables

Deliverable	Due Date ^{ab}
Pre-Remedial Design Work Plan	75 days from AOC effective date ^{c,d}
Pre-Remedial Design SAP, QAPP, HSP (including Preliminary Summary of Existing Information)	90 days from AOC effective date ^d
Summary of Existing Information and Disposal Sites Inventory Reports	120 days after EPA approval of Work Plan
Technical memorandum - Round 1A data	160 days after EPA approval of Pre-Remedial Design SAP and QAPP
Pre-Remedial Design Round 1A Data Report and Pre-Remedial Design SAP addendum - Round 1C sampling locations	240 days after EPA approval of Pre-Remedial Design SAP and QAPP
Pre-Remedial Design SAP addendum - Round 1B sampling locations	On or before May 15, 1994
Technical memorandum - Round 1B data	190 days after EPA approval of Round 1B SAP addendum
Round 1B addendum to Pre-Remedial Design Data Report	260 days after EPA approval of Round 1B SAP addendum
Technical memorandum - Round 1C Phase 1 and 2 data	190 days after EPA approval of Round 1C Phase 1 and 2 SAP addendum
Pre-Remedial Design SAP addendum - Round 1C, Phase 3	On or before May 13, 1996
Round 1C Phase 1 and 2 addendum to Pre-Remedial Design Data Report	On or before August 16, 1996
Preliminary Evaluation of Disposal Sites Report	On or before June 28, 1996
Recontamination Evaluation Report	On or before October 16, 1996
Technical Memorandum - Round 1C, Phase 3 Data	190 days after EPA approval of Round 1C Phase 3 SAP
Round 1C, Phase 3 Addendum to Pre-Remedial Design Data Report (including revised Preliminary Evaluation of Disposal Sites) and SAP, QAPP and HSP addenda for Round 2 sampling	240 days after EPA approval of the Round 1C Phase 3 SAP addendum ^{e,f}
Technical Memorandum: Natural Recovery Analysis	120 days after EPA approval of the Round 2 SAP addendum ^g
Technical Memorandum: Sediment Management Areas and Volumes	120 days after EPA approval of the Round 2 SAP addendum ^g
Technical Memorandum: Remedial Options for Sediment Management Areas	240 days after EPA approval of the Round 2 SAP addendum ^g
Technical memorandum - Round 2 data	160 days after EPA approval of Round 2 SAP addendum ^h
Round 2 addendum to Pre-Remedial Design Data Report	240 days after EPA approval of Round 2 SAP addendum ^h

Pre-Remedial Design Evaluation Report

330 days after EPA approval of Round 2 SAP and QAPP⁶

- Schedule assumes level of effort shown on Table 1A. Schedule deadlines will be extended or shortened if the level of effort approved by EPA falls above or below the assumptions in Table 1A.
- Days are calendar days.
- AOC (Administrative Order on Consent) is effective upon signature by EPA.
- If EPA disapproves the contractor selected by Respondents to develop the Work Plan, SAP, QAPP, and HSP, pursuant to paragraph 32 of the AOC, the start date for these deliverables shall be the date EPA accepts a replacement contractor.
- Schedule assumes EPA will notify HCC of statistical methods to be used for evaluation of biological data within 40 days of approval of 1C SAP.
- Respondents will meet with EPA no later than December 15, 1996 to discuss biological sampling needs for Round 2. If any Round 2 biological sampling must be conducted in a particular season, the SAP for that sampling will be submitted by the HCC no later than 90 days prior to the anticipated sampling date. In addition, Respondents agree to significantly shorten the delivery dates for these documents if Round 2 sampling does not include mobility testing.
- If EPA has not yet determined whether or not to issue an ESD or amend the ROD, or if EPA has decided to issue an ESD or to propose amending the ROD cleanup standards as set forth in Table 2, but has not yet done so, the schedule for these deliverables will be extended in accordance with Section I.B.2 of this SOW.

Note: The following Table 1A contains preliminary estimates of the level of effort that would be commensurate with the schedule in Table 1 solely for the purposes of developing the schedule for Round 1 sampling. Although this table contains reasonable preliminary estimated based on information presented during development of this SOW, EPA has not agreed to the number of stations, the number of samples per station, or the total number of samples to the quantities reflected in this table and EPA reserves the right to require sample numbers that exceed the values in Table 1A.

Table 1A—Level of Effort Assumptions for Round 1 Schedule

Event	Sample Type	No. of Stations	Samples per Station	Total Samples
Round 1A - Subsurface	Cores	50 - 70	1 - 3	100 - 140 chemistry 50 - 75 PSDDA Bioassay suites
Round 1B - Intertidal Surface	Surface	50 - 70	1 for benthic infauna, 4 replicates per station	50 - 70 chemistry 25 - 50 stations bioassay suites and benthos to major taxa
Round 1C - Subtidal Surface	Surface	50 - 70	1 for benthic infauna, 4 replicates per station	60 - 80 chemistry 25 - 50 Bioassay suites Benthic Infauna: 15 - 20 stations to species, 25 - 50 stations to major taxa
Round 1C - Subsurface Data Gaps	Cores	15 - 30	1 - 3	30 - 60 Chemistry 15 - 30 PSDDA Bioassay suites
Round 1C - Contaminant Mobility	Cores	10	1 composite at 2 - 4 stations	3 sets contaminant mobility tests

Table 2—Sediment Quality Objectives

Chemical	Sediment Quality Objective^a
Metals (mg/kg dry weight; ppm)	
Antimony	150 ^A
Arsenic	57 ^B
Cadmium	5.1 ^B
Copper	390 ^L
Lead	450 ^B
Mercury	0.59 ^L
Nickel	>140 ^{A,B}
Silver	6.1 ^A
Zinc	410 ^B
Organic Compounds (µg/kg dry weight; ppb)	
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAH)	5,200 ^L
Naphthalene	2,100 ^L
Acenaphthylene	1,300 ^{A,B}
Acenaphthene	500 ^L
Fluorene	540 ^L
Phenanthrene	1,500 ^L
Anthracene	960 ^L
2-Methylnaphthalene	670 ^L
High Molecular Weight PAH (HPAH)	17,000 ^L
Fluoranthene	2,500 ^L
Pyrene	3,300 ^L
Benz[a]anthracene	1,600 ^L
Chrysene	2,800 ^L
Benzofluoranthenes	3,600 ^L
Benzo[a]pyrene	1,600 ^L
Indeno[1,2,3-cd]pyrene	690 ^L
Dibenz[a,h]anthracene	230 ^L
Benzo[ghi]perylene	720 ^L
Chlorinated Organic Compounds	
1,3-Dichlorobenzene	170 ^{A,L,B}
1,4-Dichlorobenzene	110 ^B
1,2-Dichlorobenzene	50 ^{L,B}
1,2,4-Trichlorobenzene	51 ^A
Hexachlorobenzene (HCB)	22 ^B
Total Polychlorinated Biphenyls (PCBs)	150 ^A (1,000 ^B)

Table 2—Sediment Quality Objectives (Continued)

Chemical	Sediment Quality Objective ^a
Phthalates	
Dimethyl phthalate	160 ^L
Diethyl phthalate	200 ^B
Di- <i>n</i> -butyl phthalate	1,400 ^{A,L}
Butyl benzyl phthalate	900 ^{A,B}
Bis[2-ethylhexyl]phthalate	1,300 ^B
Di- <i>n</i> -octyl phthalate	6,200 ^B
Phenols	
Phenol	420 ^L
2-Methylphenol	63 ^{A,L}
4-Methylphenol	670 ^L
2,4-Dimethylphenol	29 ^L
Pentachlorophenol	360 ^A
Miscellaneous Extractable Compounds	
Benzyl alcohol	73 ^L
Benzoic acid	650 ^{L,B}
Dibenzofuran	540 ^L
Hexachlorobutadiene	11 ^B
N-nitrosodiphenylamine	28 ^B
Volatile Organic Compounds	
Tetrachloroethene	57 ^B
Ethylbenzene	10 ^B
Total xylenes	40 ^B
Pesticides	
p,p'-DDE	9 ^B
p,p'-DDD	16 ^B
p,p'-DDT	34 ^B

^a Lowest apparent effects threshold among amphipod, oyster, and benthic infauna:

- A - amphipod mortality bioassay
- L - oyster larvae abnormality bioassay
- B - benthic infauna

The sediment quality objective for human health has been established at 150 ppb for PCBs at the Commencement Bay Nearshore/Tideflats site, according to a method combining equilibrium partitioning and risk assessment methods.

Table 3—Target Analytes for Sediment Remedial Design^a

Conventional/Miscellaneous

- Total solids
- Total volatile solids
- Total organic carbon
- Ammonia
- pH
- Sulfide

Metals

- Antimony
- Arsenic
- Cadmium
- Chromium^b
- Copper
- Lead
- Mercury
- Nickel
- Silver
- Zinc
- Tributyltin^c

Phenols and Substituted Phenols

- Phenol
- 2-Methylphenol
- 4-Methylphenol
- 2,4-Dimethylphenol
- Pentachlorophenol

LPAH

- Naphthalene
- 2-Methylnaphthalene
- Acenaphthylene
- Acenaphthene
- Fluorene
- Phenanthrene
- Anthracene
- Total LPAH

HPAH

- Fluoranthene
- Pyrene
- Benz[a]anthracene
- Chrysene
- Benzo[b]fluoranthene
- Benzo[k]fluoranthene
- Benzo[a]pyrene
- Indeno[1,2,3-cd]pyrene
- Dibenz[a,h]anthracene
- Benzo[ghi]perylene
- Total HPAH

Chlorinated Aromatic Compounds

- 1,3-Dichlorobenzene
- 1,4-Dichlorobenzene
- 1,2-Dichlorobenzene
- 1,2,4-Trichlorobenzene
- Hexachlorobenzene

Volatile Organic Compounds

- Tetrachloroethene
- Trichloroethene^c
- Ethylbenzene
- Total xylenes

Chlorinated Aliphatic Compounds

- Hexachlorobutadiene

Phthalate Esters

- Dimethyl phthalate
- Diethyl phthalate
- Di-n-butyl phthalate
- Butylbenzylphthalate
- Bis[2-ethylhexyl]phthalate
- Di-n-octyl phthalate

Other Organic Compounds

- Benzyl alcohol
- Benzoic acid
- Dibenzofuran
- Hexachloroethane^c
- N-nitrosodiphenylamine

Pesticides/PCBs

- Total PCBs
- 4,4'-DDE
- 4,4'-DDD
- 4,4'-DDT
- Aldrin^c
- Chlordane^c
- Dieldrin^c
- Heptachlor^c
- Lindane^c

Tentatively Identified Compounds (TICs)

As determined by U.S. Environmental Protection Agency (EPA)

- Those constituents marked with an asterisk include all constituents that were identified as problem chemicals at the Commencement Bay Nearshore/Tideflats (CB/NT) site (i.e., each of these constituents appears in at least one of Tables 3–10).
- The target analyte list includes all constituents that have a CB/NT record of decision (ROD) sediment cleanup objective, a Washington Department of Ecology Sediment Management Standard, or a Puget Sound Dredged Disposal Analysis (PSDDA) screening level (SL) and maximum level (ML) value. CB/NT ROD sediment cleanup objectives are not available for those constituents that are marked with footnote "b" or "c."
- A Washington Department of Ecology Sediment Cleanup Standard exists for chromium.
- PSDDA SL and ML values exist for this constituent.

**Table 4—Chemical Decision Criteria to be used
In Pre-Remedial Design and Remedial Design**

Chemical	SQO	2LAET	PSDDA SL	PSDDA ML
Inorganics	mg/kg	mg/kg	mg/kg	mg/kg
Antimony	150	200	20	200
Arsenic	57	93	57	700
Cadmium	5.1	6.7	0.96	9.6
Chromium		270		
Copper	390	530	81	810
Lead	450	530	66	660
Mercury	0.59	2.1	0.21	2.1
Nickel	140	140	140	
Silver	6.1	6.1	1.2	6.1
Zinc	410	960	160	1,600
Nonionic Organics	ug/kg	ug/kg	ug/kg	ug/kg
LPAH	5,200	13,000	610	6,1003
Naphthalene	2,100	2,400	210	2,100
Acenaphthylene	1,300	1,300	64	640
Acenaphthene	500	730	63	630
Fluorene	540	1,000	64	640
Phenanthrene	1,500	5,400	320	3,200
Anthracene	960	4,400	130	1,300
2-methylnaphthalene	670	1,400	67	670
HPAH	17,000	69,000	1,800	51,000
Fluoranthene	2,500	24,000	630	6,300
Pyrene	3,300	16,000	430	7,300
Benz(a)anthracene	1,600	5,100	450	4,500
Chrysene	2,800	9,200	670	6,700
Benzofluoranthenes	3,600	7,800	800	8,000
Benzo(a)pyrene	1,600	3,000	680	6,800
Indeno(1,2,3-c,d)pyrene	690	1,800	69	5,200
Dibenzo(a,h)anthracene	230	540	120	1,200
Benzo(g,h,i)perylene	720	1,400	540	5,400
1,3-Dichlorobenzene	170	170	170	
1,4-Dichlorobenzene	110	120	26	260
1,2-Dichlorobenzene	50	110	19	350
1,2,4-Trichlorobenzene	51	64	13	64
Hexachlorobenzene	22	130	23	230
PCBs	150	150 ¹	130	2,500
Dimethylphthalate	160	1,400	160	
Diethylphthalate	200	1,200	97	
Di-n-butylphthalate	1,400	1,400	1,400	
Butylbenzylphthalate	900	900	470	

**Table 4—Chemical Decision Criteria to be used
in Pre-Remedial Design and Remedial Design (Continued)**

Chemical	SQO	2LAET	PSDDA SL	PSDDA ML
Di-n-octylphthalate	6,200	6,200	6,200	
Dibenzofuran	540	700	54	540
Hexachlorobutadiene	11	270	29	290
N-nitrosodiphenylamine	28	48	28	220
Ionic Organics	ug/kg	ug/kg	ug/kg	ug/kg
Phenol	420	1,200	120	1,200
2-Methylphenol	63	72	20	72
4-Methylphenol	670	1,800	120	1,200
2,4-Dimethylphenol	29	72	29	50
Pentachlorophenol	360	690	100	690
Benzyl alcohol	73	870	25	73
Benzoic Acid	650	760	400	690
Hexachloroethane			1,400	14,000
Tetrachloroethene	57	140	14	210
Trichloroethene			160	1,600
Ethylbenzene	10	37	10	50
Total xylenes	40	120	12	160
p,p-DDE	9			
p,p-DDD	16			
p,p-DDT	34	34		
Total DDT			6.9	69
Aldrin			10	
Chlordane			10	
Dieldrin			10	
Endrin				
Heptachlor			10	
Lindane			10	
Tributyltin			30	

¹ Because the cleanup level for PCBs is based on human health criteria, the SQO will substitute for the second lowest AET.

**Table 5—Biological Decision Criteria to be used
In Pre-Remedial Design and Remedial Design**

Test	Criteria to be Used for PRD Decision Making	Reference Area/Control Performance Standards	Hit Under PSDDA One Hit Rule ¹	Hit Under PSDDA Two Hit Rule ²	PSDDA Reference Area and Control Performance Standards
Amphipod	Test mean mortality > 25% and is significantly ($P < 0.05$) different from reference	Control sediment < 10% mortality; reference sediment < 25% mortality	Test mortality minus control mortality > 20% AND test mortality minus reference > 30% AND significantly different ($P < 0.05$) from reference	Test mortality minus control mortality > 20% AND significantly different ($P < 0.05$) from reference	Control sediment < 10% mortality; reference sediment < 20% mortality above control
Bivalve larvae	Test mean combined abnormality and mortality \geq 15% mean reference response AND is significantly different ($P < 0.05$) from reference	Seawater control < 50% combined abnormality and mortality	Test response (abnormality + mortality) normalized to controls > 20% AND test minus reference > 30% AND significantly different ($P < 0.05$) from reference	Test response (abnormality + mortality) normalized to controls > 20% AND significantly different ($P < 0.05$) from reference	Seawater control < 10% abnormality AND < 50% combined abnormality and mortality; reference sediment < 20% combined abnormality and mortality normalized to control normal survivor counts
Echinoderm embryo	Same as bivalve	Same as bivalve	Same as bivalve	Same as bivalve	Same as bivalve
Neanthes growth	Mean biomass < 70% of mean reference biomass and is significantly ($P < 0.05$) different	Control sediment < 10% mortality; reference sediment biomass \geq 80% control biomass	Mean biomass < 80% or > 120% of control biomass AND mean biomass < 50% or > 150% of reference AND significantly ($P < 0.05$) different from reference	Mean biomass < 80% or > 120% of control biomass AND mean biomass < 70% or > 130% percent of reference AND significantly ($P < 0.05$) different from reference	Control sediment < 10% mortality; reference sediment biomass \geq 80% control biomass
Benthic major taxa	Mean abundance of any one group < 50% of reference and significantly ($P < 0.05$) different	Assemblage representative of unimpacted areas of Puget Sound; richness and abundance within normal range of natural variability; pollution-sensitive taxa present; pollution-tolerant taxa not numerically dominant			
Microtox			Not applied	Diminution of light (blank corrected) > 20% from T_0 and significantly ($P < 0.05$) different from reference	No numeric criteria for control sediment; reference sediment < 20% light diminution over control

1. One hit constitutes a failure for non-dispersive sites.
2. Two hits constitute a failure for non-dispersive sites.

IV. BIBLIOGRAPHY

The following list, although not comprehensive, comprises many of the regulations and guidance documents appropriate for use in pre-remedial design data gathering and in design of remedial actions:

The National Contingency Plan (revised). 40 CFR Part 300.

"Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA," U.S. EPA, October 1988, OSWER Directive No. 9355.3-01.

"Superfund Remedial Design and Remedial Action Guidance" U.S. EPA, June 1986, OSWER Directive No. 9355.0-4A.

"Source Control Strategy - Commencement Bay Nearshore/Tideflats Superfund Site," May 1992, U.S. EPA Region 10.

"Standards for Confined Disposal of Contaminated Sediments," January 1990, prepared by Parametrix for the Washington Department of Ecology.

"Evaluating Environmental Effects of Dredged Material Management Alternatives - A Technical Framework," 1992, EPA and COE, EPA 842/B-92/008.

"Synoptic Measures of Sediment Contamination, Toxicity, and Infaunal Community Composition (the Sediment Quality Triad) in San Francisco Bay," 1987. P. M. Chapman, R. N. Dexter, and E. R. Long. Mar. Ecol. Prog. Ser. 37:75-96.

"A Compendium of Superfund Field Operations Methods," Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, EPA/540/P-87/001a, August 1987, OSWER Directive No. 9355.0-14.

"Data Quality Objectives for Remedial Response Activities," U.S. EPA, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, EPA/540/G-87/003, March 1987, OSWER Directive No. 9335.0-7B.

"Guidelines and Specifications for Preparing Quality Assurance Project Plans," U.S. EPA, Office of Research and Development, Cincinnati, OH, QAMS-005/80, June 1983 revision of December 29, 1980 version.

"Users Guide to the EPA Contract Laboratory Program," U.S. EPA, Sample Management Office, August 1982, revised January 1991.

"Guidance on Applicable or Relevant and Appropriate Requirements," U.S. EPA, Office of Emergency and Remedial Response, July 9, 1987, OSWER Directive No. 9234.0-05.

"CERCLA Compliance with Other Laws Manual," Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, August 1989 (interim final), OSWER Directive No. 9234.1-01 and -02.

"Health and Safety Requirements of Employees Employed in Field Activities," U.S. EPA, Office of Emergency and Remedial Response, July 12, 1981, EPA Order no. 1440.2.

OSHA Regulations in 29 CFR 1910.120 (Federal Register 45654, December 19, 1986).

"Data Quality Objectives for Remedial Response Activities: Development Process" Volume 1, U.S. EPA Office of Emergency and Remedial Response, March 1987. OSWER Directive No. 9355.0-7B.

"Recommended Protocols for Measuring Selected Environmental Variables in Puget Sound" Puget Sound Estuary Program, March 1986, and subsequent revisions.

"Remedial Action Costing Procedures Manual" OERR, October 1987, Osower Directive No. 9355.0-10.

"Guidance on Expediting Remedial Design and Remedial Action" OERR, August 1990, Osower No. 9355.5-0222.

"PSDDA Reports. Management Plans Technical Appendix-Phase I (Central Puget Sound)." 1988. Tilley, S., D. Jamison, J. Thorton, B. Parker, J. Malek. Prepared for Puget Sound Dredged Disposal Analysis by Management Plans Work Group.

"PSDDA Reports. Evaluation Procedures Technical Appendix-Phase I (Central Puget Sound)." 1988. Phillips, K., D. Jamison, J. Malek, B. Roes, C. Krueger, J. Thorton, and J. Krull. Prepared for Puget Sound Dredge Disposal Analysis by Evaluation Procedures Work Group.